



## **Final Report**

# **In-Situ Electrokinetic Remediation for Metal Contaminated Soils**

**US Army Environmental Center**

**March 2001**



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## Executive Summary

Metal contaminated soil presents one of the largest remediation problems at military sites. Unfortunately few technologies are currently available for the treatment of metals contaminated soil. The most utilized treatment alternatives for metal contaminated soil are limited to excavation and disposal (dig and haul) techniques. In many cases the soil may require pre-treatment prior to disposal, which typically involves the use of solidification/stabilization techniques. Other technologies for remediating metal contaminated soils have been or are being developed but currently have limited usage.

Options for in-situ treatment for metal contaminated soil are even more limited. In-situ solidification/stabilization, the most utilized in-situ metal treatment technology, reduces the metals mobility but the metal contaminants remain in the soil. If treatment is not complete due to issues such as poor mixing, future contaminant migration is possible. In-situ technologies where the metals are removed from the soil are limited to soil flushing, phytoremediation, and electrokinetic extraction.

The US Army Environmental Center (USAEC) and Engineer Research and Development Center (ERDC) conducted a field demonstration of electrokinetic remediation to assess the performance and cost of the technology. This demonstration, sponsored by the Environmental Security Technology Certification Program (ESTCP) and the Southwest Division, Naval Facilities Engineering Command, was conducted at a metals contaminated site at Naval Air Weapons Station (NAWS) Point Mugu, California. Electrokinetic remediation was investigated for this ecologically sensitive area because of its potential to be a less invasive technology.

The site at NAWS Point Mugu selected for the demonstration was the Site 5 – Old Area 6 Shops. Site 5 is a large area where electroplating and metal finishing operations were conducted. The area of study is approximately ½ acre in and around two former waste lagoons located in the center of Site 5. The lagoons are unlined and were used between 1947 and 1978 to receive wastewater discharge from electroplating and metal finishing activities. The largest waste generator was a plating shop that discharged approximately 95 million gallons of plating rinse solution into the lagoons. Additionally, up to 60,000 gallons of waste photographic fixer solution and small quantities of organic solvents and rocket fuel were disposed of in the lagoons.

Following a 1994 emergency removal action, surface sampling within the lagoons indicated that levels of chromium and cadmium exceeded allowable limits for California. Because of the potential for damage to the marsh area and the presence of state and federally listed endangered species in the area, a less invasive method of metals extraction was sought and electrokinetic remediation was selected as a potential solution.

Electrokinetic remediation is an in-situ process in which an electrical field is created in a soil matrix by applying a low-voltage direct current (DC) to electrodes placed in the soil. The current density is generally on the order of milliamperes per square centimeters (mA/cm<sup>2</sup>) or an electric potential difference on the order of a few volts per cm across electrodes placed in the ground. The electrodes can be placed in the soil in either a vertical or horizontal array. When DC current is applied to the electrodes, an electrical field develops between the anodes and cathodes. The application of the electric field between the electrodes has several effects on the

soil, water, and the contaminants. These include electromigration, electro-osmosis, changes in the soil and pore fluid pH, and electrophoresis.

Of these electrokinetic phenomena, the application of electrokinetic remediation to mobilize the metals in the soil at NAWS Point Mugu was expected to be predominately influenced by electromigration. Electro-osmosis was considered to be less significant due to the high permeability and the low cation exchange capacity (CEC) of the soil. Electrophoresis likewise would have a less significant effect on the NAWS Point Mugu soil. ERDC treatability studies indicated that the majority of the metal contaminants would be solubilized in the pore water as a result pH front generated by the application of electrokinetic remediation at NAWS Point Mugu. The major phenomena contributing to electrokinetic transport of the contaminants at NAWS Point Mugu was expected to be electromigration of these solubilized metals.

The objective of this demonstration was to evaluate the ability of electrokinetic remediation to extract heavy metal contaminants from impacted soil and sediment. The demonstration was designed to identify, collect, and verify the economic, operational, and performance data that will be used to validate and transfer this technology to potential users. Performance and costs were the major factors being evaluated.

Operation and monitoring of the technology was initiated in March 1998 and continued until October 1998 with a temporary shutdown for six weeks from the end of June through mid-August due to contractual issues with the technology vendor (Lynntech, Inc.). In May 1998, a three-month progress review of the demonstration was held. It was determined that the electrokinetic treatment was progressing much slower than originally expected. There was little contaminant movement, and the pH front in the soil had not developed. Also revealed at this meeting was that the current densities utilized in the bench tests were much higher than that applied in the field. The current density of the bench studies was conducted at  $0.5 \text{ mA/cm}^2$  (ERDC) and  $2.3 \text{ mA/cm}^2$  (Lynntech), while the current density applied in the field was initially  $0.1 \text{ mA/cm}^2$  and increased to approximately  $0.2 \text{ mA/cm}^2$ . This change in power to  $0.2 \text{ mA/cm}^2$  was made two weeks prior to the three-month review. In an effort to increase the rate of contaminant movement, it was decided to again increase the power applied to test cell #1. To achieve this power increase without the purchase of expensive power supplies, it was decided to reduce treatment within test cell #1 by approximately one half. This scaled-back treatment was applied to only one waste pit within the test cell, which increased the current density from  $0.2 \text{ mA/cm}^2$  to over  $0.33 \text{ mA/cm}^2$  for this reduced test area.

The reduced electrokinetic system configuration was operated for an additional ten weeks. In total, the system operated for a total of 22 weeks. At the end of this 22-week period, the pH front was just beginning to appear. Another project review conducted at this point determined that unknown factors (either system design, site soil characteristics, or both) were retarding the performance of the technology and that the technology required further investigation and development prior to full-scale implementation. On 7 October 1998, the electrokinetic demonstration at Site 5 was suspended.

Throughout the operation of the electrokinetic system monthly sampling was conducted to monitor for the release of the inorganic contaminants outside of the defined treatment zone. The electrokinetic process effects on the existing organic contaminants were believed to be inconsequential and only quarterly monitoring was conducted to track process effects on VOCs. Routine sampling began showing indications of trihalomethane accumulation (with chloroform



being the primary trihalomethane constituent) in the shallow (3 to 5 foot) piezometer wells inside and outside of the defined treatment area. It is believed that the naturally occurring chlorides present at the site are being electrochemically transformed into free chlorine at the anode well electrodes. This chlorine is saturating the pore fluid and reacting with the naturally occurring organic material in the shallow soil layer. This reaction is believed to be forming the trihalomethane compounds detected at the site.

Prior to the initiation of the electrokinetic system operations, process control zones were established between select pairs of electrode wells to monitor the progress of the metals movement. The area between AW-10 and CW-09 was baseline characterized by a soil sampling in February 98. The pore fluid sampling conducted at the end of the demonstration period showed that the pH front was developing at the 7-foot depth of the control zone profile. At this depth the front was advancing more quickly than at the other depths monitored. This is an important step in the electrokinetic process. The saturation of the soil profile with the pH front allows for the mobilization and subsequent transport of the metal contaminants.

In the baseline characterization in February 98 cadmium was seen throughout the profile primarily in the upper layer of soil (0'-5'). The concentration peaks at 50 mg/kg approximately two feet (156") from the cathode. In October 98 soil sampling a significant trend in contaminant migration was not apparent.

Chromium, like cadmium, was found initially in the upper soil layer, approximately in the middle of the profile, with concentrations reaching as high as 3,000 mg/kg. The October 98 soil sampling indicated similar results although chromium concentrations in the electrode wells were indicating increases. These increased concentrations maybe indicative of the initial stages of chromium migration within the treatment zone.

Many issues remain to be resolved prior to the full-scale commercialization of electrokinetic remediation technology. Such issues include:

1. A better understanding of the technology's effects on naturally occurring ions and how these effects impact mobilization and removal of the target contaminants. Many discrepancies between the laboratory testing and the field test were identified. The retarding effects created by the naturally occurring ions cannot be accurately quantified and their effects on the type of metal species formed under the electric field influence cannot be accurately predicted. Different metals species with different ionic charges were observed in the laboratory from what is currently being observed in the field. In addition to the retarding effects produced by the naturally occurring ions, the development of potentially hazardous by-products (i.e. chlorine, trihalomethanes, acetone, etc.) resulting from the application of an electric field on a soil containing these ions and means of inhibiting by-product production requires further investigation.
2. The limitation of electrokinetic remediation needs to be clearly identified. Laboratory testing may give a false indication on the applicability of electrokinetic remediation to a specific site. A means of identifying site specific performance limiting factors needs to be developed.
3. An improved methodology for predicting treatment performance needs to be developed.
4. A better understanding is needed of the electrode design and its effects on electric field shape and intensity.

5. An improved methodology for determining the configuration of the electrodes under field conditions.

To address these needs work continues at the ESTCP electrokinetic demonstration site under the direction of the ERDC research team. ERDC is currently conducting laboratory and pilot studies to resolve the identified research needs. Full-scale application of this technology for remediation of metals contaminated soil is limited at best until the issues stated above can be resolved.

## Table of Contents

<b>Executive Summary</b>	<b>3</b>
<b>1. Introduction</b>	<b>15</b>
1.1 Background	15
1.2 Official DoD Requirements Statements	16
1.3 Objectives of the Demonstration	16
1.4 Regulatory Issues	18
1.5 Previous Testing of the Technology	18
<b>2. Technology Description</b>	<b>19</b>
2.1 Description	19
2.1.1 Background	19
2.1.2 System Description	23
2.1.2.1 Electrode Array	23
2.1.2.2 Electrode Wells and Electrodes	24
2.1.2.3 Power Distribution System	25
2.1.2.4 Automated Process Monitoring and Control System	26
2.1.2.5 Electrolyte Amendments	26
2.1.2.6 Contaminant Recovery and Disposal System	27
2.1.2.7 Off-Gas Extraction and Treatment	29
2.2 Strengths, Advantages, and Weaknesses	30
2.2.1 Strengths and Advantages	30
2.2.2 Weaknesses	30
2.3 Factors Influencing Cost and Performance	30
<b>3. Site Facility Description</b>	<b>33</b>
3.1 Background	33
3.2 Site 5 Old Area 6 Shops	34
3.3 Site/Facility Characteristics	37
3.3.1 Climate	37
3.3.2 Topography and Tidal Influence	37
3.3.3 Regional Geology	38
3.3.3.1 Site-Specific Geology – Site 5 Old Area 6 Shops	38

3.3.4	Hydrogeology	40
3.3.4.1	Semi-Perched Aquifer and Clay Cap	40
3.3.4.2	Oxnard Aquifer	41
3.3.4.3	Mugu Aquifer	41
3.3.4.4	Fox Canyon and Grimes Canyon Aquifers	41
3.3.5	Groundwater Occurrence	42
3.3.6	Surface Water Hydrology	42
3.3.6.1	Site-Specific Surface Water Hydrology – Site 5 Old Area 6 Shops	44
<b>4.</b>	<b>Demonstration Approach</b>	<b>45</b>
4.1	Performance Objective	45
4.1.1	Treatability Study Validation	45
4.1.2	Performance Assessment	45
4.1.3	Cost Assessment	46
4.1.4	Safety Assessment	46
4.1.5	Regulatory Acceptance	46
4.2	Physical Setup and Operation	46
4.2.1	Demonstration Setup	47
4.2.1.1	Barrier Wall Installation	47
4.2.1.2	Enclosure Installation	47
4.2.1.3	Piezometer Well Installation	48
4.2.2	Electrokinetic System Installation	50
4.2.2.1	Utility Installation	50
4.2.2.2	Electrokinetic Remediation Equipment Installation	51
4.2.3	Electrokinetic Remediation System Operation	53
4.2.3.1	Electrokinetic Remediation System Operation Chronology	54
4.2.4	Process Waste	56
4.3	Sampling Procedures	56
4.3.1	Advancia Sampling Program	57
4.3.1.1	Effluent Sampling	57
4.3.1.2	Soil Sampling	57
4.3.1.3	Surface Water and Groundwater Sampling	58
4.3.1.4	Supplemental VOC Monitoring	60
4.4	Analytical Procedures	60

<b>5. Performance Assessment</b>	<b>61</b>
5.1 Performance Data	61
5.2 Data Assessment	64
5.2.1 Demonstration Objectives Assessment	68
5.2.1.1 Treatability Study Validation	68
5.2.1.2 Performance Assessment	68
5.2.1.3 Safety Assessment	75
5.2.1.4 Regulatory Acceptance	75
5.3 Technology Comparison	76
<b>6. Cost Assessment</b>	<b>77</b>
6.1 Cost Performance	77
6.1.1 Capital Cost	77
6.1.2 O&M Costs	77
6.1.3 Other Technology-Specific Costs	79
6.1.4 Quantity Treated/Unit Cost	79
6.2 Cost Comparison	79
<b>7. Regulatory Issues</b>	<b>81</b>
<b>8. Technology Implementation</b>	<b>82</b>
8.1 DoD Need	82
8.2 Transition	82
<b>9. Lessons Learned</b>	<b>83</b>
<b>10. References</b>	<b>87</b>

## **Appendices and Enclosure**

Appendix A: Points of Contact	A-1
Appendix B: Data Archiving and Demonstration Plan	B-1
Appendix C: Organic Sampling Data Results	C-1
Appendix D: Inorganic Sampling Data Results	D-1
Appendix E: Chromium VI Sampling Data Results	E-1
Appendix F: Biota Study Report	F-1
Appendix G: Process Control Zone pH Profiles	G-1

## **Figures**

Figure 1: General Schematic of Electrokinetics	19
Figure 2: Schematic Showing Electrode Well Placement	24
Figure 3: Electrode Well Construction	25
Figure 4: Electrokinetic Fluid System Schematic	28
Figure 5: NAWS Point Mugu Regional Location Map	33
Figure 6: NAWS Point Mugu General Location Map	34
Figure 7: NAWS Point Mugu Site Map – Site 5 Old Area 6 Shops	35
Figure 8: Soil Sample Sites – Advancia Characterization Study	36
Figure 9: NAWS Point Mugu Geologic Cross Section	39
Figure 10: NAWS Point Mugu Groundwater Contour Map – Upper Aquifer	43
Figure 11: NAWS Point Mugu Surface Drainage Map	43
Figure 12: Barrier Wall Schematic	47
Figure 13: Temporary Enclosure	48
Figure 14: Piezometer Locations	50
Figure 15: Test Cell #1 Electrode Wells Installed	51
Figure 16: Control Trailer	52
Figure 17: Process Piping and Electric Cable Installed	52
Figure 18: Process Control Zone Sampling Points	54
Figure 19: Electrode Wells Operated by ERDC	56
Figure 20: Baseline Cadmium Profile	65

Figure 21:	Baseline Chromium Profile	65
Figure 22:	Cadmium Profile (October 1998)	69
Figure 23:	Chromium Profile (October 1998)	69
Figure 24:	GoreSorber Module Results, July 1998 and February 1999 Rounds	72
Figure 25:	Reductive Halogenation of PCE to Vinyl Chloride	73
Figure 26:	PCE to Vinyl Chloride Reduction – Piezometer P-16	74

## **Tables**

Table 1:	Parameters Affecting Cost and Performance	31
Table 2:	SIC Codes for Military Activities at NAWS Point Mugu	34
Table 3:	Range of Metal Concentrations in Soil by Test Cell	37
Table 4:	Permeability Values for Sediment at Site 5 Old Area 6 Shops	40
Table 5:	Piezometer Information	49
Table 6:	Basic Operating Parameters	53
Table 7:	Treatment Timeline for Test Cell #1	55
Table 8:	Sample Locations, Intervals, and Analytes	57
Table 9:	Baseline Groundwater and Surface Water Sampling	58
Table 10:	Groundwater and Surface Water Sampling (Test Cell 1 Operation)	59
Table 11:	Revised Groundwater and Surface Water Sampling (Reduced Test Cell 1 Operation)	59
Table 12:	Analytical Procedures	60
Table 13:	ACZ Laboratories	62
Table 14:	FGL Laboratories (Chromium VI Analysis)	63
Table 15:	Deviations Between Lynntech Bench Scale Testing and Field Operations	66
Table 16:	Electrode Well Chromium Concentrations	67
Table 17:	Summary of Validation Components	70
Table 18:	Electrokinetic Remediation Unit Costs	80

## Acronyms

A	Ampere
Ag	Silver
ARARs	Applicable Relevant and Appropriate Requirements
AWQC	Ambient Water Quality Criteria
bls	Below Land Surface
Br	Bromine
CA	California
Cd	Cadmium
CEC	Cation Exchange Capacity
CERCLA	Comprehensive Environmental Response
	Compensation and Liability Act
cfs	Cubic Feet per Second
Cl <sub>2</sub>	Chlorine
COC	Contaminant of Concern
Cr	Chromium
Cu	Copper
DC	Direct Current
DCE	Dichloroethene
DTSC	Department of Toxic Substances Control
DoD	Department of Defense
DU	Depleted Uranium
EDR	Electrodialysis Reversal
EDTA	Ethylenediaminetetraacetic acid
ERDC	Engineering Research and Development Center
ESTCP	Environmental Security Technology
	Certification Program
°F	Fahrenheit
H <sup>+</sup>	Hydrogen ion (proton)
HDPE	High Density Polyethylene
H <sub>2</sub>	Hydrogen
H <sub>2</sub> S	Hydrogen Sulfide
IDW	Investigation Derived Waste
IRP	Installation Restoration Program
Kw	Kilowatt
mA/cm <sup>2</sup>	milliampere per square centimeter
mgd	Million Gallons per Day
msl	Mean Sea Level
NaOH	Sodium Hydroxide
NAVFAC	Naval Facilities Engineering Command,
NAWS	Naval Air Weapons Station
Ni	Nickel
NPDES	National Pollution Discharge Elimination System
O <sub>2</sub>	Oxygen
OH <sup>-</sup>	Hydroxyl ion



O&M	Operation and Maintenance
Pb	Lead
PCE	Tetrachloroethene
pH	Potential of Hydrogen
ppm	parts per million
PRG	Preliminary Remediation Goals
PVC	Polyvinyl Chloride
RCRA	Resource, Conservation and Recovery Act
RD&D	Research, Design and Development Permit
RWQCB	Regional Water Quality Control Board
SIC	Standard Industrial Classification
STLC	Soluble Threshold Limit Concentration
SVOC	Semi-volatile Organic Compounds
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TTLC	Total Threshold Limit Concentration
USEPA	US Environmental Protection Agency
USAEC	US Army Environmental Center
V	Volt
VOC	Volatile Organic Compound
V/cm	Volts per centimeter

# **In-Situ Electrokinetic Remediation for Metal Contaminated Soils**

**US Army Environmental Center**

**January 2000**

## **1.0 Introduction**

### **1.1 Background Information**

Military activities are one of the primary contributors to metals-contaminated soil problems. Military operations such as small arms training, electroplating and metal finishing operations, explosive and propellant manufacturing and use, and the use of lead-based paint at military facilities result in vast tracts of land being contaminated with metals. Consequently, there is a military need to develop cost-effective remediation tools for cleaning up metals-contaminated soil.

In-situ electrokinetic remediation was identified as a possible method of extracting the metal contaminants from the soil. Several companies are currently developing and marketing electrokinetic remediation as an in-situ cleanup technology for metals contaminated soil. The technology involves placing a series of electrodes (anodes and cathodes) in the soil. A low-voltage current is applied to the electrodes resulting in an electric field being generated between the electrodes. The applied electric field induces four phenomena to occur: electromigration, electroosmosis, electrophoresis, and pH depression across the field. These phenomena are manipulated through variations in electrode well design and electrolyte amendments. Manipulation of these phenomena induces the movement of metals toward the electrodes where they can be extracted.

In-situ electrokinetic remediation is less invasive in ecologically sensitive areas and potentially more cost-effective than other metals removal technologies. This electrokinetic remediation demonstration project, jointly funded by the Environmental Security Technology Certification Program (ESTCP) and the Naval Facilities Engineering Command (NAVFAC), Southwest Division, was conducted at Naval Air Weapons Station (NAWS) Point Mugu, California. The US Army Environmental Center (USAEC) and the Engineering Research and Development Center (ERDC) at Waterways Experiment Station conducted the demonstration. A complete list of the technology demonstration points of contact is presented in Appendix A.

## **1.2 Official DoD Requirement Statements**

Following are the official Department of Defense (DoD) requirements statements that identify and rank the environmental contaminant problems that may potentially be addressed by the demonstrated technology.

- Navy 1.I.4.j - Improved Isolation and Treatment of Heavy Metals in Soil. Priority: High
- Army 1.3.e - Treatment Technology for Soil Contaminated with Inorganics. Priority: High
- Army 1.3.j - Treatment of Depleted Uranium (DU) Contaminated Soil. Priority: Medium
- Army 1.4.c - Remediation of Heavy Metals Contamination of Facilities. Priority: Medium
- Air Force 95-2009 - More Cost Effective Treatment Methods to Remediate Sites with Metal Contaminants in Vadose. Priority: Medium
- Air Force 95-233 - Hazardous Waste Treatment Technologies for Installation Restoration Program (IRP) Site Remediation of Heavy Metals. Priority: Low

This demonstration of in-situ electrokinetic remediation will address these DoD requirement statements through the evaluation and assessment of the demonstration objectives stated in subsection 1.3.

## **1.3 Objectives of the Demonstration**

The objective of this demonstration was to evaluate the ability of electrokinetic remediation to extract heavy metal contaminants from impacted soil and sediment. The demonstration was designed to identify, collect, and verify the economic, operational, and performance data that will be used to validate and transfer this technology to potential users. Performance and costs are the major factors being evaluated.

The following are the evaluation points addressed by the demonstration:

1. Validation of the ERDC treatability study predictions of the technology's performance.
2. Assessment of the performance of electrokinetic remediation of metal contaminated soil:
  - a. The ability of the electrokinetic technology to reduce metal contaminant levels in soil to below federal regulatory action levels for metals concentration and toxicity criteria as measured by Toxicity Characteristic Leaching Procedure (TCLP), California state Total Threshold Limit Concentration (TTLC), and Soluble Threshold Limit Concentration (STLC) levels.
  - b. The ability of the electrokinetic technology to achieve remediation goals that are based on human health risk and site background levels. Contaminant reductions were to be compared to established Modified US Environmental Protection Agency's (USEPA) Region 9 Preliminary Remediation Goals (PRG) that are based on human health risk assessments and established site background levels. Lowering of the contaminant concentrations in the test cells to target levels protective of human health should result in ground water and surface water levels below current USEPA Marine Ambient Water Quality Criteria (AWQC). Contaminant reduction to these levels will be protective of the marine benthic community that may be at risk from the chromium levels in the surface water (PRC, 1995).

- c. The ability to control the effects of the electrokinetic technology in both an artificially confined and an unconfined treatment area. For this study an artificially confined treatment area was defined as an area around which a non-conductive barrier wall had been installed to mitigate the influences of groundwater flow and tidal effects on the electrokinetic remediation process. The unconfined treatment area was open to groundwater and tidal effects. The technology demonstration was monitored to verify control and containment of the electric field effects and control of contaminant migration and emissions. Process dynamics were assessed using surface water, groundwater, and soil contaminant levels measured prior to, during, and after system operation.
  - d. Identification of off-gas emissions resulting from the operation of the electrokinetic technology.
  - e. Monitoring the effects of the electrokinetic technology on organic contaminants in the soil. No effects were anticipated due to the low levels of organic contaminants present in the test areas.
  - f. Identification of biota impacts resulting from the use of the electrokinetic technology.
  - g. Determination of the potential for recycling of the waste material extracted by the electrokinetic technology.
  - h. Identification of site-specific characteristics affecting the performance of the technology.
3. Quantification of the costs associated with the use of the electrokinetic technology:
    - a. Capital cost associated with electrokinetic remediation.
    - b. Operation and maintenance costs associated with electrokinetic remediation.
    - c. Site characteristics that affect electrokinetic remediation costs.
  4. Assessment of the safety issues related to the use of the electrokinetic technology:
    - a. Specific site characteristics that affected the safe operation of the electrokinetic system.
    - b. Potential health hazards to the site workers and the public resulting from electrokinetic process fugitive emissions (i.e. hydrogen (H<sub>2</sub>), oxygen (O<sub>2</sub>), or chlorine (Cl<sub>2</sub>) gas).
  5. Assessment of local public and regulatory acceptance of the electrokinetic remediation technology.

The demonstration was conducted in and around two former wastewater lagoons at NAWS Point Mugu, Site 5, Old Area 6 Shops. The demonstration area encompassed an approximately 1/2-acre area in and around the former waste lagoons. The actual size of the two planned demonstration treatment areas was approximately 1/8 of an acre each. The two unlined lagoons were used to dispose of approximately 95 million gallons of metal plating rinse water from past industrial operations at NAWS Point Mugu. Tidal salt marsh areas and wetlands surround these lagoons. The wetlands are inhabited by the light-footed clapper rail, a federally- and state-listed endangered species. The in-situ electrokinetic technology demonstration was expected to economically remove metal contaminants (cadmium, chromium, nickel, copper, lead, and silver) from the soil with minimal impact to the environment. Electrokinetic remediation may provide the only viable in-situ extraction technology for removal of metal contaminants from soil at sites where limiting area ecological disturbance is a priority.

#### **1.4 Regulatory Issues**

The regulatory issues commonly faced by installations with heavy metal contaminated sites are:

- a) Local, state, and federal applicable or relevant and appropriate requirements (ARARs).
- b) The impacts of the contaminants to potential receptors, both human and ecological.
- c) The environmental impact of solidification or excavation and disposal of the contaminated soil.
- d) The “cradle to grave” liability of installations with heavy metal contaminated soil.

#### **1.5 Previous Testing of the Technology**

Electrokinetic remediation has been extensively tested at the laboratory and bench scale with a variety of contaminants and soil types. These tests have shown that with proper catholyte amendment heavy metal extraction efficiencies of greater than 95% can be achieved. Pilot scale testing has been conducted by ERDC at Radford Army Ammunition Plant, Virginia and Fort Polk, Louisiana. The Radford tests indicated in-situ mobilization of the metal contaminants and removal efficiencies of over 95% of the lead contaminants in some areas of the treatment zone. Fort Polk testing, though not complete, indicated significant lead mobilization and removal at the electrodes. In both pilot scale tests the lead contaminants were removed either as elemental lead plated on the electrode surface or as ionic species in the electrolyte solution.

## 2.0 Technology Description

### 2.1 Description

#### 2.1.1 Background.

Electrokinetic remediation is an in-situ process in which an electrical field is created in a soil matrix by applying a low-voltage direct current (DC) to electrodes placed in the soil (Figure 1). The current density is generally on the order of milliamperes per square centimeter ( $\text{mA}/\text{cm}^2$ ) or an electric potential difference on the order of a few volts per centimeter ( $\text{V}/\text{cm}$ ) across electrodes placed in the ground.

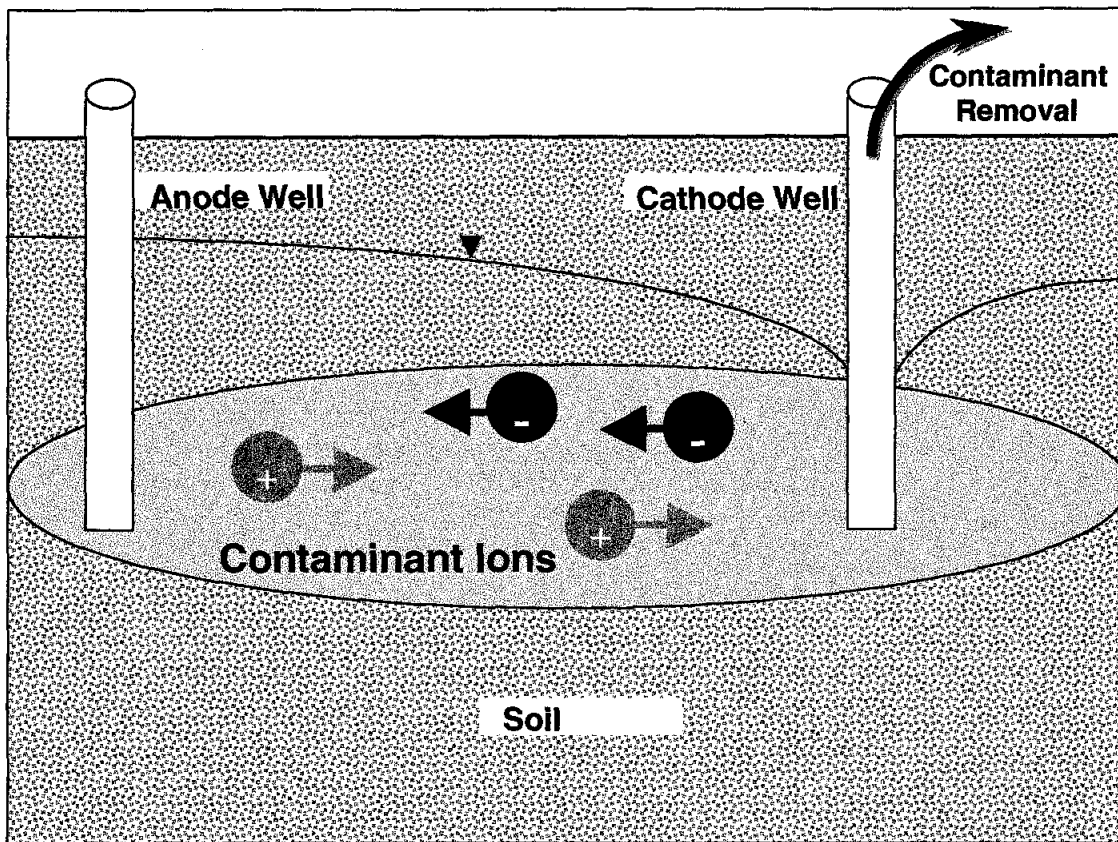


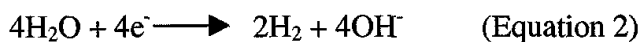
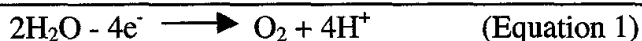
Figure 1: General Schematic of Electrokinetics

The electrodes can be placed in either a vertical or horizontal array. When DC current is applied to the electrodes, an electrical field develops between the anodes and cathodes. The application of the electric field has several effects on the soil, water, and contaminants. These effects include electromigration, electroosmosis, changes in pH, and electrophoresis.

Electromigration refers to the movement of cations and anions under the influence of the electrical field. Cations (positively charged ions) tend to migrate towards the negatively charged cathode, and anions (negatively charged ions) migrate towards the positively charged anode. Cations that migrate include alkali metals (sodium and potassium), alkali earth metals (calcium and barium), and transition metals (iron and nickel). Anions that migrate include chromates, chlorides, arsenates, nitrates, and phosphates. These ions concentrate in the solutions near the electrodes or may undergo reactions at the electrodes, which may plate the metals onto the electrodes or liberate gaseous compounds.

Electroosmosis is a bulk transport of water, which flows through the soil as a result of the applied electrical field. The water transport towards the cathode is the result of the difference of electrical potential across the electrodes. This phenomenon is a result of the electrical field effect on the boundary film of water immediately adjacent to the soil particles. The surface of the soil particles exhibit a charge that aligns water molecules (which are polar) with opposite electric charges thus forming a boundary film of water molecules on the soil surface. The molecules immediately adjacent to the surface are fixed by electrical charges. Other water molecules, although aligned with the fixed molecules, are not tightly bound and may move. In the presence of an applied electric field, these movable water molecules will appear positively charged and move toward the cathode (Cabrera-Guzman, et al. 1990). Studies indicate that electroosmosis is most effective in fine-grained soil however it does occur in sand.

pH changes occur under the influence of the current as a result of electrolysis reactions at the electrodes. Oxidation of water occurs at the anode and generates hydrogen ( $H^+$ ) ions (Equation 1).  $H^+$  ions generate an acid front, which migrates to the cathode. In contrast, reduction of water occurs at the cathode and generates hydroxyl ( $OH^-$ ) ions (Equation 2), which migrate as a base front towards the anode (Acar, et al. 1988).



The transport of the  $H^+$  ions is approximately two times faster than the  $OH^-$  ions. Thus, the acid front moves at a greater rate than the base front (Acar and Alshawabkeh 1993).

Unless the transport of the proton ( $H^+$  ion) is retarded by the soil buffering capacity, the soil between the electrodes will be acidified. This acidification results in solubilization of contaminants due to desorption and dissolution of species from soil. Once contaminants are present in ionic form in the soil pore fluid, they migrate to the electrode opposite in polarity under the applied electric field and/or via electroosmosis, leading to their extraction from the soil at the electrodes.

Electrophoresis refers to the movement of charged particles under the influence of the electric field. As with electromigration, positively charged particles migrate towards the cathode and negatively charged particles migrate towards the anode. While electrophoretic transport occurs in soil, it is suspected to have less influence on contaminant treatment than the other phenomena discussed above. This is a result of the soil acting as a filter and reducing the range of particle transport.

Of the electrokinetic phenomena discussed, the application of electrokinetic remediation to mobilize the metals in the soil at NAWS Point Mugu was expected to be predominately influenced by electromigration. Electroosmosis was considered to be less significant due to the high permeability and the low cation exchange capacity (CEC) of the soil. Low soil CEC limits the formation of the diffuse double layer of water molecules on the soil particle surface that is thought to be necessary for electroosmosis to occur. Hydraulic transport as a result of a differential in head could match or exceed the water transport by electroosmosis. Although electroosmosis may be an effective treatment mechanism in some cases, the bulk transport of the liquid induced by a hydraulic head differential would have a more significant effect at NAWS Point Mugu. Electrophoresis likewise would have a less significant effect on the NAWS Point Mugu soil. ERDC treatability studies indicate that the majority of the metal contaminants would be solubilized in the pore water as a result of the pH front generated by the application of electrokinetic remediation at NAWS Point Mugu. The major phenomena contributing to electrokinetic transport of the contaminants at NAWS Point Mugu is electromigration of these solubilized metals.

Heavy metals tend to precipitate under conditions of elevated pH, thus as the base front moves through the soil, it would meet the advancing cationic metals and acid front. As the acid is neutralized, the metals would precipitate from solution, slowing or even stopping the migration of the cations (Acar and Alshawabkeh 1993; Probstein and Hicks 1993). This precipitation decreases concentrations of the ionic species in the pore fluid, decreasing the electrolyte strength, and rendering a zone of low electric conductivity in the soil adjacent to the cathode compartment. The formation of this zone results in a significant increase in the voltage drop across the soil and a commensurate increase in the energy expenditure. Experimental studies indicate that as the electrokinetic remediation process is continued, eventually the soil would plug, stopping electroosmotic flow as well as electromigration. The voltage gradient will increase across this isoelectric point (or point of neutralization), resulting in high power requirement and costly, ineffective treatment.

Based on the fundamental understanding of the process, different methods were proposed to enhance transport and extraction of cationic species under electric fields and to prevent formation of immobile precipitates. The main objective of these methods were to neutralize the cathode water electrolysis reaction thus avoiding generation and transport of high concentrations of the  $\text{OH}^-$  ions into the soil. Neutralization of the catholyte (the electrolyte in the cathode well) electrolysis reaction would eliminate the base front and its subsequent precipitation of soluble metals. This would assist in decreasing the electrical potential difference across the electrodes, decrease energy expenditure, and lower the ultimate cost of using the treatment process. Different options available to institute control of the electrolysis reaction in the cathode included:



**a) Enhancement Reagents for Catholyte Neutralization/Depolarization**

Various acids may be introduced to neutralize the water reduction reaction at the cathode (Acar and Alshawabkeh, 1993). Strong acids, such as hydrochloric or nitric acid, and weak acids, such as acetic acid or sulfamic acid, can be introduced at the cathode at a controlled rate to prevent an increase in the catholyte pH. This method also results in an introduction of ions into the treatment zone that may complex with the metal ions to form more mobile metal complexes, thus enhancing electromigration.

**b) Anolyte Recycling**

The anolyte (the electrolyte in the anode well) pH drops to less than 2 during the electrokinetic remediation process. Some of the anolyte may be extracted from the anode and added to the cathode at a controlled rate to neutralize the  $\text{OH}^-$  ion production. This method is expected to be cost effective, but the anolyte requires treatment prior to introduction in the cathode to remove unwanted contaminants. The process minimizes the need to use any external reagents, thus minimizing the cost of the process assuming the treatment of the anolyte is less expensive than the purchase and handling of chemical amendments.

**c) Membrane Enhancement**

Another enhanced cationic extraction technique is the use of membranes in the cathode (Electrokinetics, Inc. 1995). The objective of using a membrane is to minimize or avoid the transport of the base generated at the cathode into the soil. Nafion™ is such a membrane, which is permeable to various cations and polar compounds. The size and ionic properties of the cations and polar compounds determine their mobility through the polymer. However, Nafion™ is impermeable to negatively charged compounds, thus limiting transport of  $\text{OH}^-$  ions into the soil. In addition, Nafion™ is insoluble in most solvents and is resistant to attack from strong oxidizing agents and strong bases.

**d) Other Enhancement Approaches**

One of the concerns of metal extraction by the advance of the acid front is the potential for excessive release of some of the soil minerals, such as aluminum and silicon. If release of soil minerals is not acceptable and/or is regulated, it might be necessary to use other extraction reagents. Reagents that complex metals in a negatively charged form might be used. For example, soil contaminated with arsenic will require arsenic extraction as anionic complexes. Similarly, citric acid may be used in the catholyte at a specific pH range to achieve a negatively charged form of uranyl ions in radioactive waste sites. The negatively charged complexes would then be transported towards the anode, where they would be collected and extracted. Other chelating agents, such as Ethylenediaminetetraacetic acid (EDTA), could also be introduced in the cathode to enhance anionic extraction of metals from soil by electrokinetic remediation. Once these agents are introduced at the cathode, their ligands will migrate under the applied electric gradient towards the anode. The ligands then extract metals from the soil surface by forming negatively charged chelates. The major advantage of using chelating agents in electrokinetic remediation is their ability to selectively chelate and solubilize target metals in the soil pore fluid.

### **2.1.2 System Description**

Lynntech, Inc., a Texas-based company, was selected to design, install, and operate the electrokinetic remediation system at NAWS Point Mugu. The selection process is documented in USAEC Report No. SFIM-AEC-ET-CR-97033. Each company marketing this technology has a specific approach with a patented or proprietary methodology based on their understanding of the electrochemical effects that the applied electric field has on the contaminants of concern. Although methodologies vary slightly from one company to another, the basic theories and concepts behind the electrokinetic remediation technology are uniform in each company's application of the technology. Lynntech's approach to the technology involved the application of a non-uniform electric field in the soil treatment zone. This non-uniform electric field was achieved by applying pulsed DC voltage signal between the electrodes. Lynntech claims that the application of a pulsed electric field reduces the time of the soil treatment (up to 30%) and reduces the energy cost. Lynntech believes the application of this pulsed electric field causes:

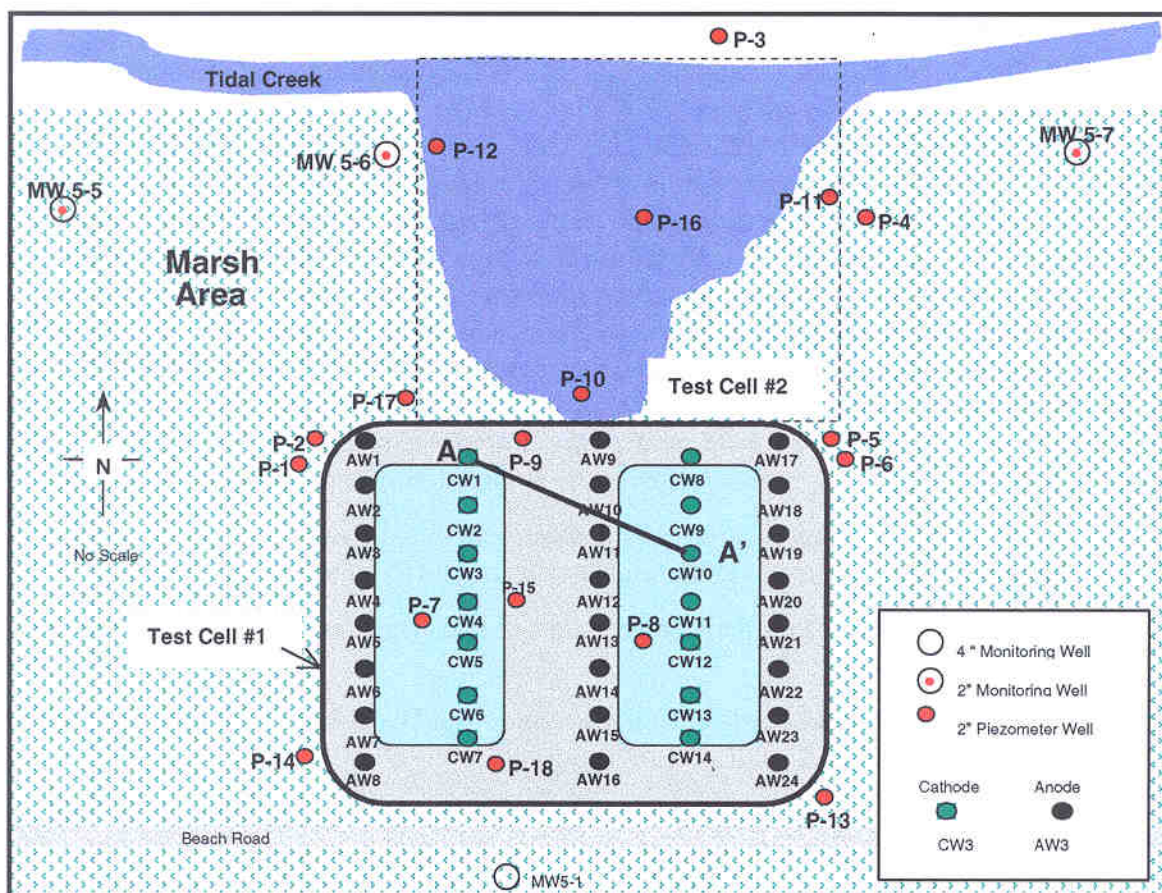
- A "disturbance" (polarization) of the electrochemical double layer present on soil particles which enhances contaminant desorption from the soil,
- Polarization of non-charged contaminants in soil which enhances their movement in the soil,
- An "electrochemical stirring" of the soil pore fluid by frequent changes in voltage applied through the soil, and
- An increased electroosmotic flow compared to a uniform constant electric field (Hodko et al 1999).

These claims of accelerated treatment or reduced costs have not been validated in field trials.

The electrokinetic remediation system basically consists of an array of electrodes, a power distribution and control system, automated process monitoring equipment, and process piping to distribute chemical amendments to the electrode wells and to extract contaminants from the electrode wells. Other equipment necessary to support system operations due to the site conditions at NAWS Point Mugu included off-gas extraction and treatment equipment to treat the gases that were generated in the electrode wells during system operation.

#### **2.1.2.1 Electrode Array**

The electrode array consists of a series of anodes and cathodes housed in wells. Figure 2 illustrates the array of anodes and cathodes that were installed within the test area at NAWS Point Mugu. The spacing between the electrode wells was established by Lynntech based on the voltage gradients observed during preliminary field tests conducted in October 1997. These field tests allowed Lynntech to define the area that could be effectively remediated by the applied electric field at various well spacings. Based on these tests the optimum distance between the anodes and cathodes was determined to be 14 feet. The optimum distance between each anode well in the anode well rows (as well as each cathode well in each cathode well row) was determined to be 6 ½ feet (Hodko et al 1999).



**Figure 2: Schematic Showing Electrode Well Placement**

**NOTE:** The section line (A-A') in Figure 2 delineates the cross-sections in Figures 25 and 26.

#### 2.1.2.2 Electrode Wells and Electrodes

The electrode wells contain either anodes (positive electrodes) or cathodes (negative electrodes) (Figure 3). The anode electrode wells are 4-inch diameter slotted polyvinyl chloride (PVC) well casings. The anode well casings were wrapped in a tightly woven linen fabric. The well packing was a kaolinite and sand mixture. The cathode wells are 3-inch diameter porous ceramic well casings with a kaolinite and sand packing mixture. The specific well designs are considered proprietary Lynntech designs. Lynntech believed the well construction and packing mixes would enhance contaminant transport into the wells. This had not been validated in field trials.

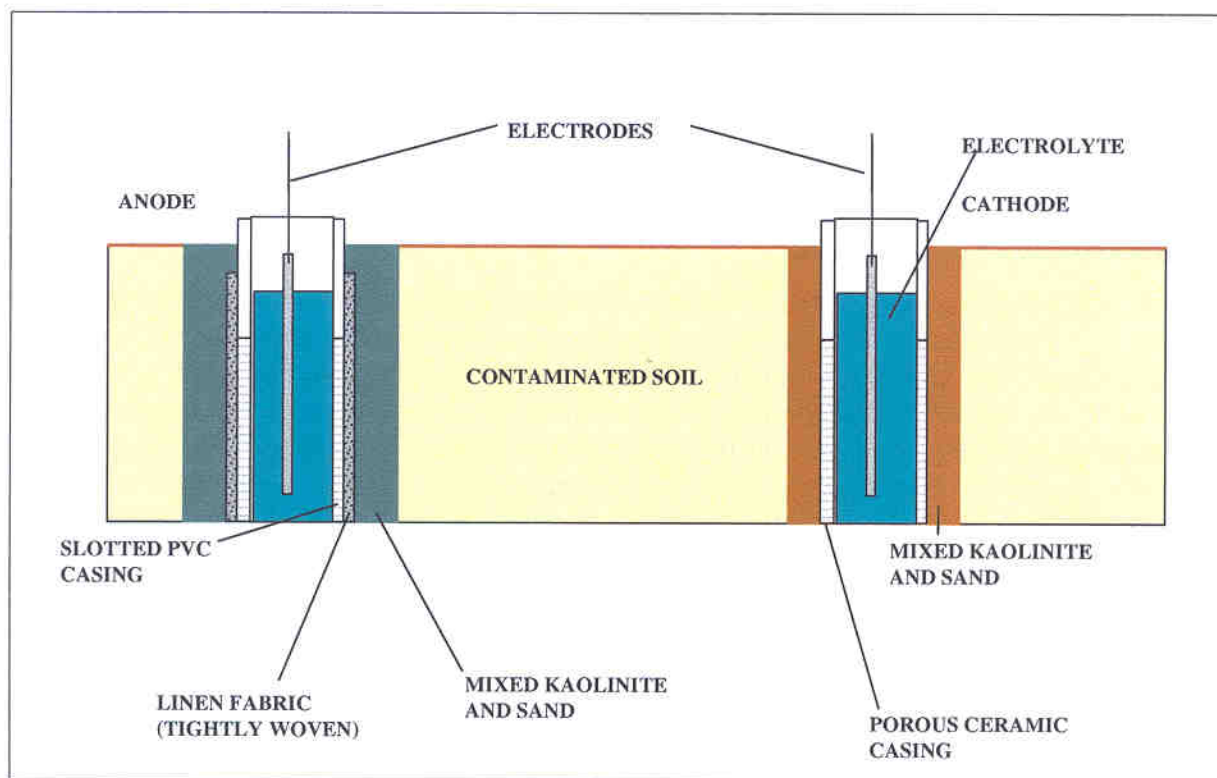
The electrode materials used in the anode and cathode well were selected based on their ability to withstand the corrosive processes created by the application of the electric field. The anode electrode, which operates under highly corrosive conditions, was a rod shaped electrode constructed of titanium with an iridium oxide coating. The cathode electrode was constructed from approximately 2-inch wide strips of stainless steel mesh.

The anode and cathode wells are capped with PVC couplings for easy removal. The anode wells were sealed with a vent system attached to vent the gases produced during system operation (e.g., chlorine and oxygen) to a scrubber unit prior to release to the atmosphere. Initially, the cathode well was vented to the atmosphere since only small volumes of hydrogen gas were



expected to be produced. During the demonstration at NAWS Point Mugu, hydrogen sulfide gas ( $H_2S$ ) was detected in the cathode wells. Upon determination that  $H_2S$  was being produced during system operation, the cathode wells were sealed and the gases were vented to a scrubber unit prior to release to the atmosphere.

The wells were installed using standard well drilling and casing installation practices. The only notable exception was the extra care required to install the cathode well ceramic casings. These casings were brittle and easily broken.



**Figure 3: Electrode Well Construction**

### 2.1.2.3 Power Distribution System

Electrical power is applied to the electrode array via three 10-kilowatt (KW) power supplies (EMI part number ESS 30-333). Each of these power supplies is capable of delivering up to 30 volts (V) at up to 333 amps (A). The power supplies were hooked in series to deliver up to 90 V at up to 333 A. Application of the electric power to the electrode array was controlled by an on-site computer system with customized LabView 4.0 software. The control system applied a pulsed 45 V power supply to the electrode array. The applied current fluctuated with the varying resistivity of the soil in the treatment area. The resistivity varies due to heterogeneity's in the soil, varying of the soil volume treated, and with time as the ion load in the soil is changed by the electrochemical reactions that occur during the electrokinetic system operation. The control system also monitored temperature in the soil and electrode wells and the applied voltage gradient to control the electric power supplied to the electrode array. Excessive temperature increases in the soil and electrode wells would indicate that too much power was being supplied to the treatment area and being wasted to heat generation. An increase in voltage gradient would

indicate that the resistivity of the treated soil was increasing and higher current density is required to maintain the mobility of the contaminant ions. The power supply current and the current applied to each individual well were logged by the computer system.

#### **2.1.2.4 Automated Process Monitoring and Control System**

An on-site trailer housed the equipment necessary to operate and monitor the system. The electronic system was designed to provide for multi-signal monitoring of the system process. Each well had sensors that monitored solution temperature, voltage, pH, and current. All operating data were logged by the computer system. Computer monitoring and control was accessed remotely from Lynntech's home office in Texas via modem hookup. In addition to monitoring the data stated above and regulating the power input to the electrode array, the computer system also was designed to monitor fluid level sensors and alarms for fluid levels. The computer control system provided for the remote operation of the pumps in the process piping system to transfer the fluids from the electrode wells to the holding tanks and to add amendments to the cathode wells (Hodko et al 1999).

#### **2.1.2.5 Electrolyte Amendments**

Amendments are used to control the formation of the pH front in the treatment area. Factors in selecting an amendment include cost, hazardous characteristics of the amendment, and the desired reaction. The desired reaction not only involves the mitigation of  $\text{OH}^-$  or  $\text{H}^+$  ion production at the cathode and anode wells but also involves the amendments' reaction with the contaminants of concern. As found during the field demonstration at NAWS Point Mugu, the amendments' potential effect on other naturally occurring organic and inorganic species as well as its effect on biological activity may also be of concern. Common cathode well amendments investigated for use at NAWS Point Mugu during laboratory trials were:

- Acetic Acid ( $\text{C}_2\text{H}_4\text{O}_2$ )
- Citric Acid ( $\text{C}_6\text{H}_8\text{O}_7$ )
- Oxalic Acid ( $\text{C}_2\text{H}_2\text{O}_4$ )
- Nitric Acid ( $\text{HNO}_3$ )
- Sulfuric Acid ( $\text{H}_2\text{SO}_4$ )

As a result of initial public and regulatory concerns with the use of mineral acids, nitric and sulfuric acids were not proposed for use during the demonstration. Of the organic acids tested in laboratory trials, citric acid provided the best contaminant mobility and removal results (Bricka et al., 2000). All of the acids were able to prevent the migration of  $\text{OH}^-$  ions into the soil; however, citric acid resulted in the formation of soluble metal citrates that were capable of electromigrating to the electrodes. In addition, the citrates act as chelators, enhancing the heavy metal solubility in the pore fluid. The citric acid was readily available, relatively inexpensive, and environmentally benign. Oxalic acid was eliminated as a potential amendment due to the high levels of calcium ions in the soils. Because of the calcium ions, the use of oxalic acid would result in the precipitation of calcium oxalate, which plugs the system. Laboratory tests with acetic acid resulted in slightly less desirable removal results than citric acid and the cost was significantly higher.

The system for the storage and distribution of the citric acid amendment to the cathode wells is depicted in the system schematic in Figure 4. Bags of dry citric acid are mixed with water in a 1,000-gallon double walled tank at a 13-wt% concentration. The citric acid solution is transferred from the tank to the cathode wells via a low-noise pump. Solenoid valves control the delivery of the citric acid amendment to each cathode well. The volume delivered to each cathode well is monitored and controlled via a flowmeter. All equipment, pump, solenoid valves, and flowmeter, are continuously monitored and controlled by the central computer control system described in section 2.1.2.4.

In the anode well  $H^+$  ions are produced that depress the pH in the anode wells and are transported through the soil towards the cathode wells. The acid front solubilizes metal ions on the soil surface. This is required to support transport of the metal ions toward the wells. As a result of this pH front the soil was expected to decrease to a pH of approximately 4. Experience had indicated that a pH lower than 2.5 was unlikely to be attained because of normal soil buffering capacity. By monitoring the soil pH through frequent core sampling and sampling soil pore fluid using piezometers, any depression of pH below the 2.0 level could be detected and controlled by electrical current adjustment to the wells or the addition of a base chemical to the anode wells. Provisions were incorporated into the system design to provide for base chemical amendment addition to the anode wells in the event that the pH level could not be controlled. This system is described below. No amendment additions were needed in the anode wells during the technology demonstration.

The system for the storage and distribution of the base amendment to the cathode wells is depicted in the system schematic in Figure 4. A 60-gallon double walled tank was provided for the storage of sodium hydroxide at an estimated 4 to 5 molar concentration. (The actual concentration added was to be determined based on the conditions observed in the event base addition was needed.) The base solution could be transferred from the tank to the anode wells via a low-noise pump. Solenoid valves control the delivery of the base amendment to each anode well. The volume delivered to each anode well could be monitored and controlled via a flowmeter. All equipment, pump, solenoid valves, and flowmeter, are continuously monitored and controlled by the central computer control system described in section 2.1.2.4.

#### **2.1.2.6 Contaminant Recovery and Disposal System**

The electrokinetic remediation system was designed extract the metal contaminants via electromigration of the contaminant ions and concentration of the ions in the electrode wells. The majority of these contaminants were expected to remain in solution with only minimal plating occurring on the electrodes. Once metal contaminant concentrations had built up in the electrode well, processing of the electrolyte fluid would be conducted to extract the metal contaminants and return the processed electrolyte fluid back to the wells for continued use. This would have minimized the volume of waste generated by the process and resulted in the production of a potentially recyclable material. Processing of the fluid consisted of periodically pumping the fluid from the wells to a 1,000-gallon double walled effluent tank (Figure 4). The frequency of extracting the contaminated electrolyte from the wells would be determined based on the concentration of the metals in the electrolyte and the observed effects the metals contaminated electrolyte was having to the electrokinetic system's removal efficiency. Once contaminated electrolyte fluid had been collected in the effluent tank, the fluid would be

## Flow Diagram - Test Cell 1

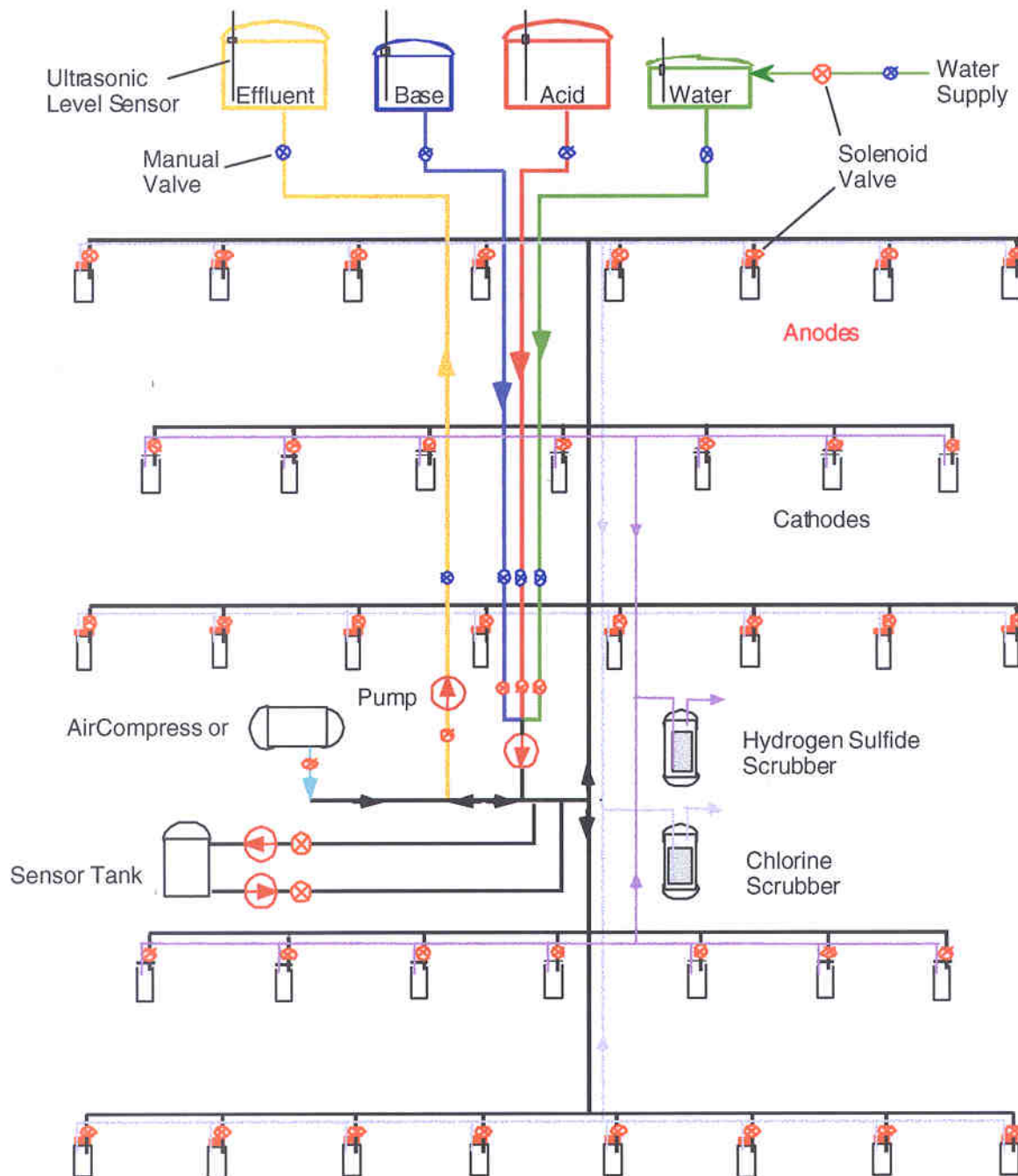


Figure 4: Electrokinetic Fluid System Schematic.

processed by circulating the fluid through an electrodialysis reversal (EDR) unit. The fluid would be processed until water quality requirements as stated in the *Water Quality Control Plan, Los Angeles Region* (RWQCB, 1995) are met to allow reuse of the processed water in the electrode wells. If the water did not meet the required standards, it would be placed in 55-gallon drums, characterized, manifested, and shipped to a licensed disposal facility. Any waste sludge resulting from the process was to be stored on-site for analysis, classification, and disposal or recycle (if possible).

#### 2.1.2.7 Off-Gas Extraction and Treatment

As a result of the electrolysis reactions at the electrodes, oxygen gas is formed at the anode and hydrogen gas is formed at the cathode. These gases are usually allowed to vent to the atmosphere. However, due to the presence of sodium chloride in the soil and groundwater, chlorine gas was produced in the anode wells along with the oxygen. This was detected during the laboratory trials and off-gas extraction and treatment for the anode wells was incorporated into the system design. During the conduct of the field demonstration, the formation of hydrogen sulfide gas in the cathode wells was detected. A field modification was performed to extract and treat the off-gas from the cathode wells. The off-gas extraction and treatment system for the anode and cathode wells consisted of capping the wells with PVC couplings for easy removal and installing a vent system to vent the gases produced during system operation to a scrubber unit prior to release to the atmosphere. Passing the gases through a column of sodium hydroxide solution (5.0 molar) stripped the chlorine and hydrogen sulfide gases. The chlorine gas produced at the anode and the processing reaction of the chlorine gas within the scrubber is shown in Equations 3 through 6.

<u>Generation at anode</u>	$2 \text{ Cl}^- \rightarrow \text{Cl}_2 + 2 \text{ e}^-$	Equation 3
<u>Scrubber Step 1</u>	$\text{Cl}_2 + \text{H}_2\text{O} \rightarrow \text{HOCl} + \text{H}^+ + \text{Cl}^-$	Equation 4
<u>Scrubber Step 2</u>	$\text{HOCl} + \text{NaOH} \rightarrow \text{NaOCl} + \text{H}_2\text{O}$	Equation 5
<u>Scrubber Step 3</u>	$\text{H}^+ + \text{Cl}^- + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$	Equation 6

The discovery of the hydrogen sulfide evolution in the cathode wells was attributed to metal sulfides in the soil. Equation 7 shows how the  $\text{H}_2\text{S}$  may have been generated as the hydrogen ion front solubilized iron sulfides in the soil as it moved from the anode to the cathode array. Similar reactions would occur with other metal sulfides in the soil. Once generated, the hydrogen sulfide moved to the cathode wells. The gas was treated in the scrubber where it was reacted with sodium hydroxide (NaOH) as shown in Equation 8.

$2\text{Fe}_2\text{S}_3 + 12\text{H}^+ \rightarrow 6\text{H}_2\text{S}_{(\text{g})} + 4\text{Fe}^{+2}$	Equation 7
$\text{H}_2\text{S} + 2 \text{ NaOH} \rightarrow 2 \text{ H}_2\text{O} + \text{Na}_2\text{S}$	Equation 8

The vent system was modified during the demonstration to increase efficiency of gas extraction from the well fluid. Initially, the headspaces of the wells were evacuated with a vacuum pump with the pump discharge being routed through the scrubber prior to release to the atmosphere. To increase the efficiency of chlorine gas removal from the anode wells, an air sparging system was installed to accelerate gas extraction as it was produced on the anode electrode. This was used in tandem with the existing headspace evacuation system.



## **2.2 Strengths, Advantages, and Weaknesses**

### **2.2.1 Strengths and Advantages**

Electrokinetic remediation is a possible in-situ method of extracting heavy metal contaminants from the soil. It is potentially less invasive in ecologically sensitive areas and potentially more cost-effective than other metals removal technologies (e.g., excavation and disposal). Unlike soil flushing, soil washing, and in-situ solidification/stabilization minimal chemical utilization is required. Also, as opposed to in-situ solidification/stabilization and excavation/disposal of contaminated soil, the contaminants are removed from the soil by the process, thereby limiting future liability that may possibly result from future contaminant release. The extracted contaminants may also be recyclable.

### **2.2.2 Weaknesses**

In-situ electrokinetic remediation is a long-term process, and it usually takes several months to years for a complete removal of contaminants. In-situ applications are limited to areas free of underground utilities. The electrokinetic effects may degrade underground cable or piping. Also, buried metal debris may distort the electric field generated between the electrodes thus disrupting the desired field effects and cleanup performance of the technology. Cleanup efficiency, cost, and time frame varies with site-specific geological and hydrological characteristics. The induced electrokinetic effects may have to compete with naturally occurring ions that may be preferentially mobilized or may retard the mobility of the contaminant ions. These naturally occurring ions may also result in the formation and release of potentially hazardous by-products when the electrokinetic technology is applied.

## **2.3 Factors Influencing Cost and Performance**

The matrix characteristics and operational parameters that may potentially affect the cost and performance of the technology are summarized in Table 1.

**Table 1: Parameters Affecting Cost and Performance**

<b>Soil Type</b>	<b>Soil Classification</b>	The type of soil will have an effect on electroosmotic flow that may have a minimal effect on the rate of contaminant removal. The chemical composition of the soil can have a tremendous effect on performance and cost due to the presence of ions that will compete with the removal of the contaminant ions
	<b>Clay Content and/or Particle Size Distribution</b>	The clay content of soil will have an effect on electroosmotic flow that may have a minimal effect on the rate of contaminant removal. Impact on cost should be negligible. No known impact is expected from variations in particle size distribution.
<b>Aggregate Soil Matrix Properties</b>	<b>Hydraulic Conductivity</b>	None. The conditions that produce high hydraulic conductivity may decrease electroosmotic flow but may be beneficial to electromigration transport.
	<b>Moisture Content</b>	Extremely low moisture content may necessitate moisture addition to the treatment area to generate the electric field resulting in an increase of installation and operation costs. It may also impact the ability to control contaminant transport between the electrodes.
	<b>Air Permeability</b>	None
	<b>pH</b>	High pH (>7) soil will typically increase the time required to establish the electrokinetically induced pH front that acts to mobilize the target contaminants. The result is a longer clean time frame and higher treatment cost.
	<b>Porosity</b>	None
	<b>Depth bgs or Thickness of Zone of Interest</b>	Electrode well equipment and installation costs will increase with depth and treatment zone thickness. No known effect on performance.
<b>Organic Properties</b>	<b>Total Organic Carbon</b>	High levels may slow electromigration of the contaminant ions due to the adsorptive capacity of the organics. Results in longer treatment time frame and increased cost.

**Table 1: Parameters Affecting Cost and Performance (Continued)**

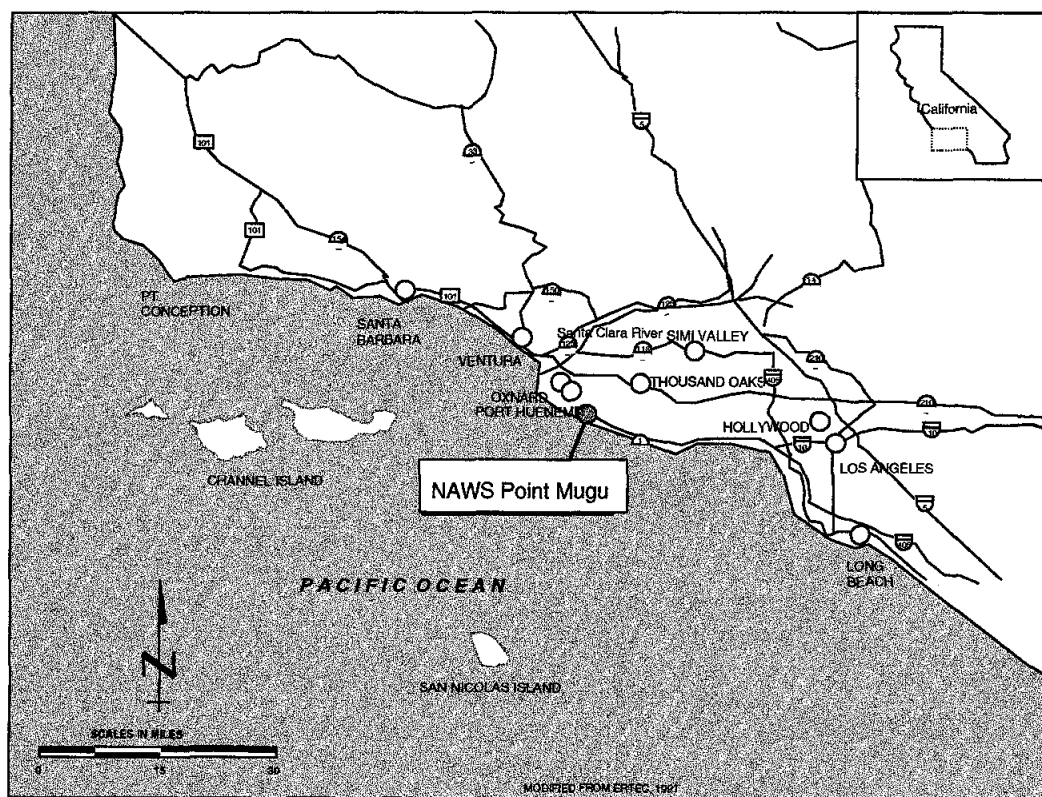
<b>Organic Properties (Continued)</b>	Oil and Grease or Total Petroleum Hydrocarbons	May result in vapor phase hydrocarbons accumulating in the wellhead space thus necessitating off-gas treatment. Depending on the amendments used, biological degradation of the hydrocarbons may be stimulated. Effects on performance and cost will be site specific.
	Presence of NAPL	No known effects.
<b>Miscellaneous Matrix Characteristics</b>	Salinity	The presence of high salinity content introduces competing ions into the treatment area that may result in retarded performance, higher operating costs, and potential by-product formation.
<b>System Parameters</b>	pH	The pH range in which the system is operated may need to be varied based on the target metal contaminants and the soil matrix properties. Aggressive lowering of the operating pH level may lead to increased power and amendment usage and cost.
	Pumping Rate	The frequency of electrode well pump down can affect effluent processing and disposal costs. Allowing the contaminant concentrations to build in the electrode wells will decrease these costs as long as extraction efficiency is not diminished by the increasing concentrations.
	Temperature	Induced temperature increases in the soil is an indication that electrical usage is being lost to heat as opposed to stimulating contaminant mobility and transport. Temperature increases should be minimized to minimize electrical costs.
	Washing/Flushing Solution Components/Additives and Dosage	The selection of the electrolyte amendments will vary with the target contaminant mix, soil matrix properties, and regulatory restrictions. Amendment selection can significantly impact clean up duration and cost.
<b>Biological Activity</b>	Microbial Activity	Depending on the amendments used, microbial activity can be stimulated which may have either beneficial or adverse impacts on the systems performance and cost. Must be determined on a site-specific basis.

### 3.0 Site Facility Description

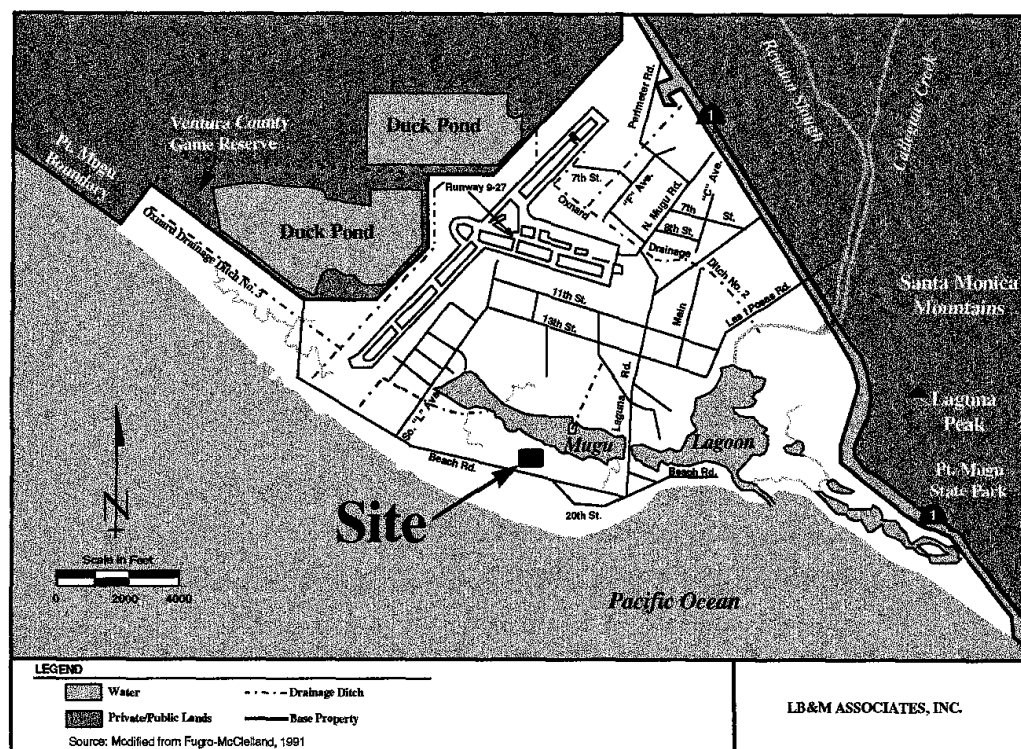
### 3.1 Background

NAWS Point Mugu is located in Ventura County, California, approximately 50 miles northwest of Los Angeles (Figure 5). Established in 1944, the main base comprises approximately 4,500 acres (PRC, 1993). NAWS Point Mugu is bordered by Highway 1 on the north and east, the Pacific Ocean on the south and west, and a Ventura County Game Reserve on the west and northwest (Figure 6). The Navy has conducted operations at NAWS Point Mugu since 1945. In 1946, the Naval Air Missile Test Center was commissioned. Military and industrial operations at NAWS Point Mugu have contaminated large tracts of land and surface and ground water from activities that included electroplating and metal finishing processes, explosive and propellant manufacturing and use, and handling of lead-based paints.

The electrokinetic technology demonstration was conducted in and around former chemical waste lagoons at NAWS Point Mugu at Site 5 Old Area 6 Shops (Figure 7). The historical activities conducted at this site are typical of many of the metals contaminated sites within the DoD.



**Figure 5: NAWS Point Mugu Regional Location Map**



**Figure 6: NAWS Point Mugu General Location Map**

### 3.2 Site 5 Old Area 6 Shops

Waste disposal activities in the vicinity of Site 5 date back to 1947. Several different disposal or spill locations are encompassed within Site 5. The Old Area 6 Shops are located along Beach Road just west of the south end of Laguna Road (Figure 7). Each disposal or spill location is less than an acre in size, and all are the result of lab and shop operations in the Old Area 6 Shops between the years of 1947 and 1978 (PRC, 1993). Operations in this area and the Standard Industrial Classification (SIC) Codes for the activities are presented in Table 2.

**Table 2: SIC Codes for Military Activities at NAWS Point Mugu**

Site Location	Activity	SIC Codes
Site 5 Old Area 6 Shops	Electroplating	3471
Site 5 Old Area 6 Shops	Heat Treatment and Machine Works	3728
Site 5 Old Area 6 Shops	Photo Processing	7389

Site 5 is a large area in which electroplating and metal-finishing operations were conducted. The area of study is approximately 1/2 acre in and around two former waste lagoons located in the center of Site 5 (Figure 7). The lagoons are unlined and were used between 1947 and 1978 to receive wastewater discharge from the electroplating and metal finishing activities. The largest waste generator in the area was the plating shop that reportedly disposed of up to 95 million gallons of plating rinsate between 1948 and 1965 (PRC, 1993). In the late 1940s and early 1950s, the photo and rocket fuel chemical shops disposed of waste photo fixer and developer,

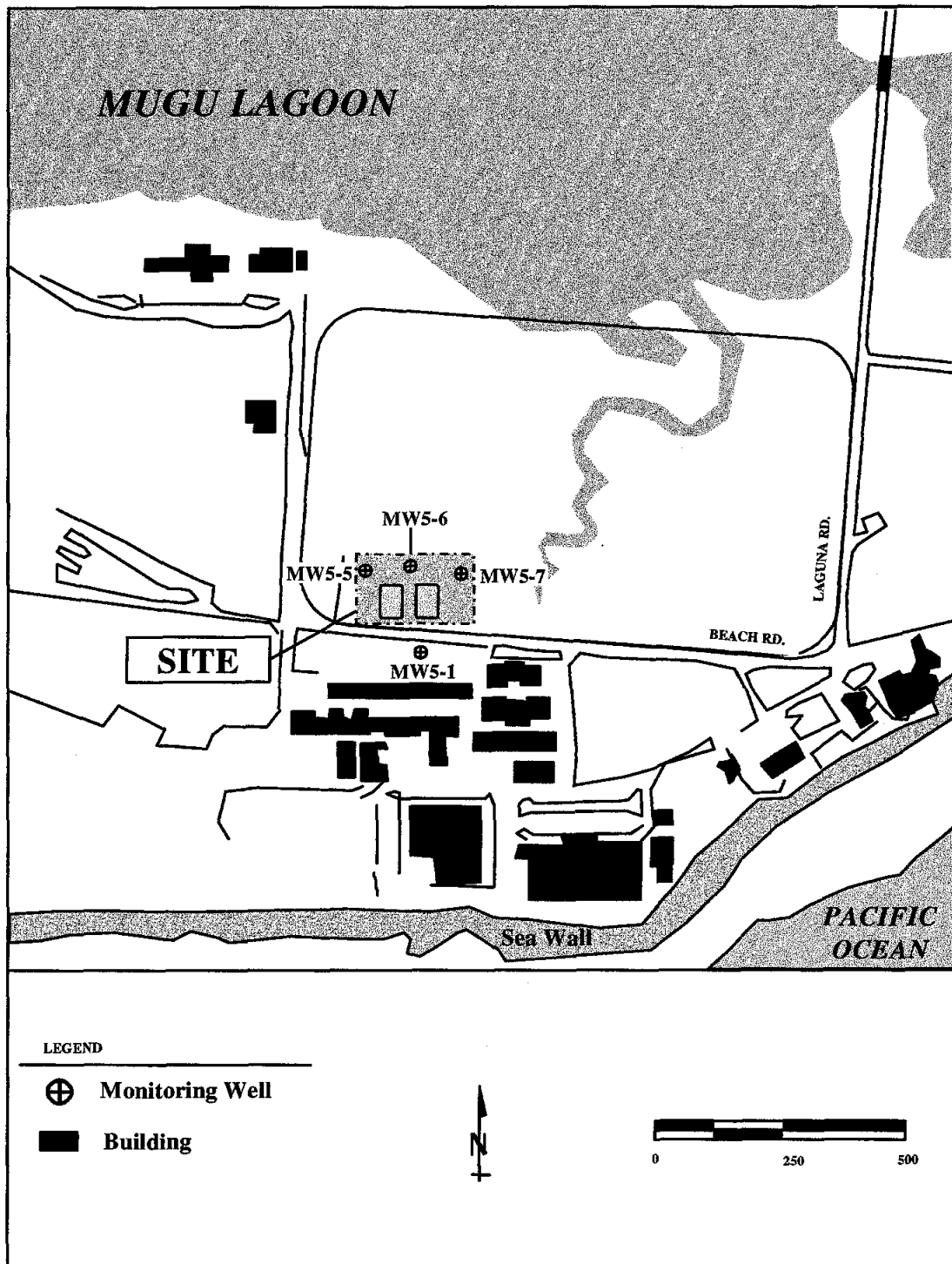


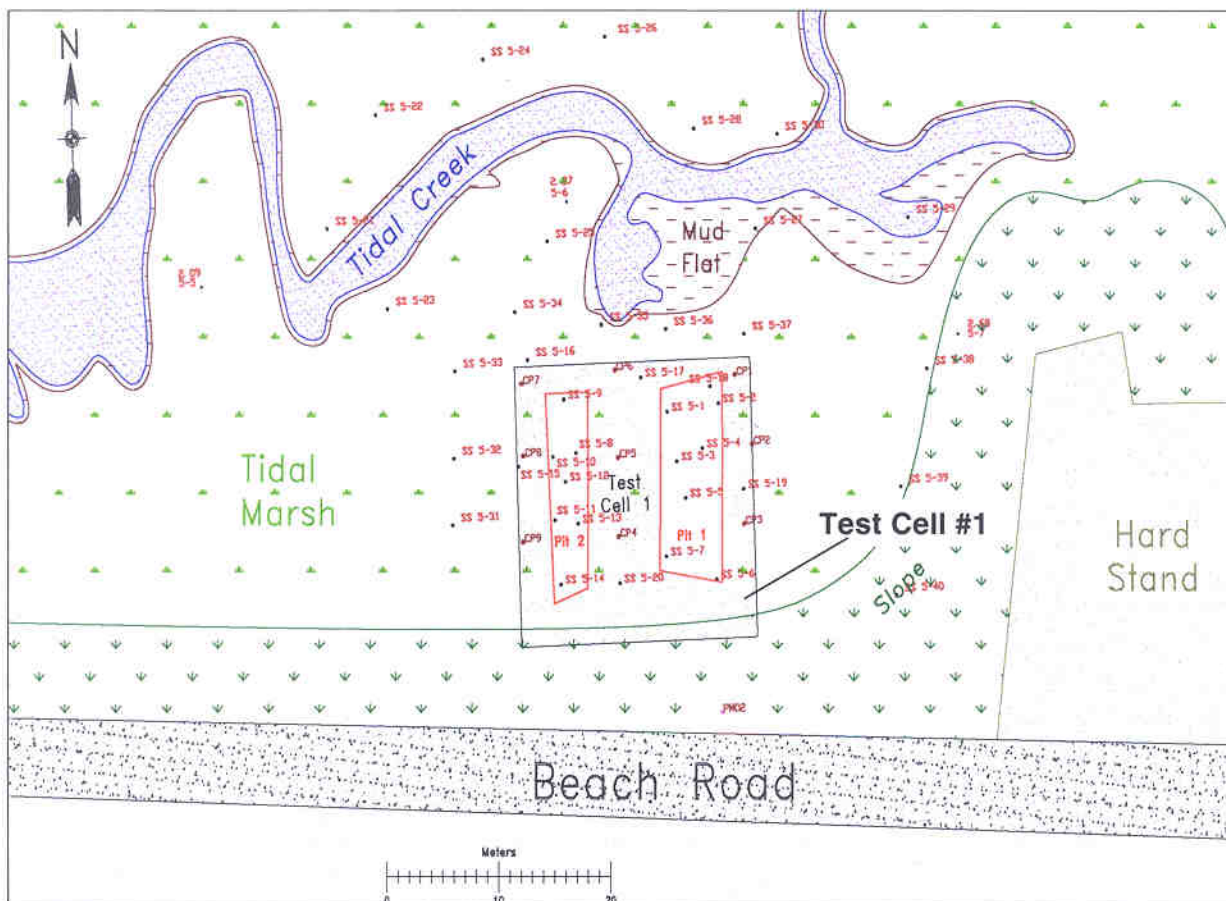
Figure 7: NAWS Point Mugu Site Map - Site 5 Old Area 6 Shops



organic solvents, chemical wastes, and rocket fuel into septic tanks terminating into Mugu Lagoon (PRC, 1993).

In 1994, an emergency removal action was performed during which approximately 117 cubic yards of material were excavated from the waste lagoons. The removal action was executed to limit the exposure of several residential and migratory birds and to reduce the source of contamination that could impact the surface and ground water. After the removal action was performed, surface sampling within the lagoons indicated that levels of chromium and cadmium (up to 25,100 mg/kg and 1,810 mg/kg, respectively) exceeded allowable limits for California 22 CR 66261.24 (2,500 mg/kg and 100 mg/kg, respectively).

The Advancia initial site characterization sampling (USAEC, 1997) inside and outside of the waste lagoon indicated that the highest contaminant concentrations were located in the surface soils. The locations of the soil, surface water, and groundwater sampling conduct at Site 5 are shown in Figure 8. Nearly 500 samples were taken during the initial site characterization at sites



**Figure 8: Soil Sample Sites – Advancia Characterization Study**

in and around the former waste lagoons to fully assess the lateral and vertical extent of the contamination. The principal contaminants of concern at Site 5 Old Area 6 Shops were chromium (Cr), cadmium (Cd), copper (Cu), nickel (Ni), lead (Pb), and silver (Ag) (Table 3). All of these were detected within the soil, ground water, and surface water at Site 5 Old Area 6 Shops during the characterization work. Chromium and cadmium were the contaminants of greatest concern because of the high concentrations detected at several points within the site.

Contaminant concentrations rapidly decreased with depth. In the marsh area immediately outside of the waste lagoon area, the contaminant levels dropped to non-detect within 2 feet of the surface. Contaminant levels within the waste lagoons extended much deeper, however, at the 2 to 3 foot depth, concentrations had dropped well below the California allowable limits. Other potential contaminants of concern, such as arsenic, beryllium, manganese, fluoride, tetrachloroethane, trichloroethene, and Aroclor-1260 were found insignificant during the characterization work. Cyanide, a contaminant often encountered in conjunction with electroplating wastes, was not detected.

**Table 3: Range of Metal Concentrations in Soil by Test Cell**

CONTAMINANT	MINIMUM LEVEL DETECTED (MG/KG)		MAXIMUM LEVEL DETECTED (MG/KG)	
	Test Cell #1 <sup>1</sup>	Test Cell #2 <sup>2</sup>	Test Cell #1 <sup>1</sup>	Test Cell #2 <sup>2</sup>
Chromium (III)	40.7	NA	2540	NA
Chromium (VI)	0.3	NA	5.9	NA
Chromium (Total)	47	44.8	13,765	25,100
Cadmium	ND	ND	1810	157
Nickel	3.2	7.9	1333	108
Lead	ND	ND	215	108
Silver	ND	ND	163.6	31.9
Copper	ND	7	1960	3880

1. Sample analyses based on 20 sample points

2. Sample analyses based on 4 sample points.

NA - Not Analyzed

ND - Not Detected

### 3.3 Site/Facility Characteristics

#### 3.3.1 Climate

The coastal setting of the installation influences the climate in the vicinity of NAWS Point Mugu. The result is a moderately humid climate with mild, moist winters and warm, dry summers (PRC, 1993). Based on climatological data obtained by the NAWS Point Mugu weather station, the average annual temperature is approximately 58 degrees Fahrenheit (°F). The average minimum monthly temperatures range from 44°F in January to 58°F in August; average maximum monthly temperatures range from 62°F in January to 72°F in September. Average monthly humidity ranges from a minimum of 43% to a maximum of 96% (PRC, 1993).

#### 3.3.2 Topography and Tidal Influences

The ground surface at NAWS Point Mugu is relatively flat with most elevations ranging from sea level to approximately 11 feet above mean sea level (msl) (PRC, 1993). The present configuration of Mugu Lagoon is a result of channelization and diversion of Calleguas Creek, as well as filling portions of the lagoon for construction of the base facilities and dredging the



central portion of the lagoon near the mouth of Calleguas Creek (PRC, 1993). The boundaries of Mugu Lagoon vary seasonally and are also heavily influenced by tidal levels and the quantity of fresh water entering from Calleguas Creek, Revolon Slough, and other tributaries, including Oxnard Drainage District ditches (PRC, 1993).

Mugu Lagoon is relatively shallow (generally less than 10 feet in depth), and water levels are significantly influenced by tides. Circulation patterns within the lagoon are characterized by slow water circulating and flushing rates in the extreme western portion of the lagoon and moderate to fast circulating and flushing rates in the eastern and central sections of the lagoon (PRC, 1993). Mugu Lagoon also receives sediment from tributaries and from tidal action. On average, 54 acre-feet (87,000 yd<sup>3</sup>) of sediment are deposited annually into Mugu Lagoon (PRC, 1993). Sedimentation rates increase during winter months as run-off increases flow in Calleguas Creek and other tributaries. Most sediment enters the lagoon in suspension and settles due to low flow.

### **3.3.3 Regional Geology**

NAWS Point Mugu lies in the southern portion of the Ventura Basin within the Transverse Ranges geomorphic province (PRC, 1993). The Transverse Ranges province consists of highlands, basins, and east-west trending folds that have resulted from regional strike-slip and thrust faulting. NAWS Point Mugu surrounds Mugu Lagoon, a major wetlands that is located at the southeastern corner of the Oxnard Plain and just west of the western end of the Santa Monica Mountains. The Ventura Basin is underlain by a thick accumulation of late Tertiary and Quaternary sediment. Approximately, the upper 2,000 feet of the sediment are unconsolidated water-bearing deposits of Pleistocene to Holocene age. The unconsolidated Pleistocene to Holocene sediment in the Oxnard Plain is approximately 1,500 feet thick and consists of alluvial clay, silt, sand, and gravel (Figure 9). The deposits occur as both laterally continuous layers and lenticular beds. Much of the land of NAWS Point Mugu has been formed from mechanically compacted fill material.

#### **3.3.3.1 Site-Specific Geology - Site 5 Old Area 6 Shops**

During a February 1997 Site Characterization conducted by Advancia Corporation (formerly LB&M Associates, Inc.) core logs revealed that the subsurface geology at Site 5 Old Area 6 consists of fine- to medium-grained sand with lenticular and laterally continuous gravel, silt, and clay strata. Subsurface soil samples were removed from 6 and 12-foot cores, drilled either by hand or by a drill rig. Additionally, three 20-foot monitor wells were drilled to determine the extent of contamination in the ground water. Subsurface sediment cores were drilled adjacent to monitor wells MW5-5 and MW5-7. The cores were drilled to 60 feet and analyzed for grain-size, grain shape, color, percent clay and silt, mineral and rock content, and water content. Due to the destructive nature of drilling, no bedding surfaces were observed during coring operations. MW5-6 was drilled to 20 feet with no subsurface core. One existing up-gradient monitor well, MW5-1, is located on the south side of Beach Road (Figure 7).

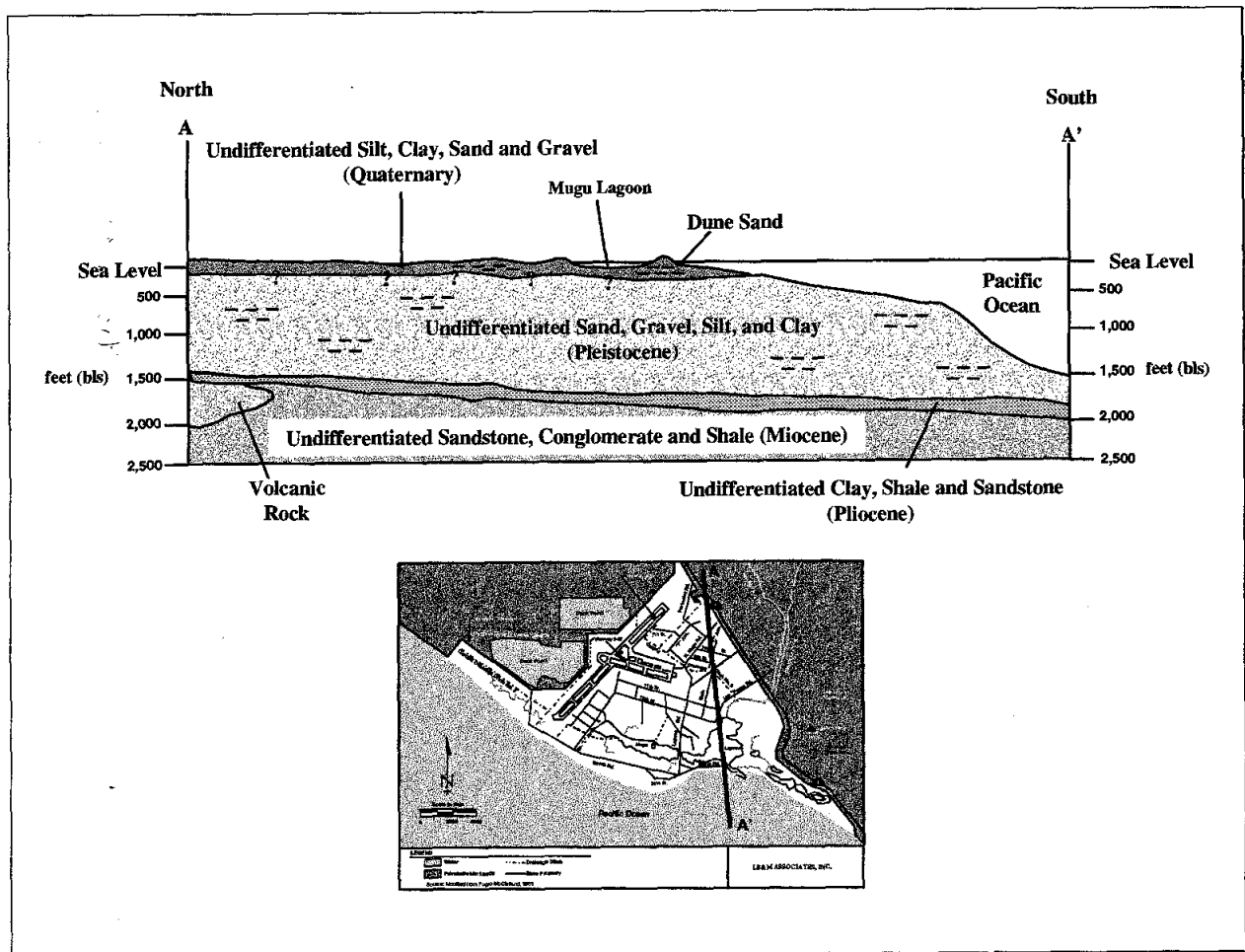
Analyses were conducted by ERDC on soil from borings taken at monitor wells MW5-5 and MW5-7. On-site observations and soil analyses verify that the sediment is mostly sand and silt with subordinate gravel and clay. As shown in Table 4, permeability values for the sediment generally decrease with depth.

## Gravel

Gravel clasts are rounded to subrounded, unconsolidated, quartz and potassium feldspar in a poorly sorted matrix of medium- to fine-grained sand. Gravel color (MUNSELL® Soil Color Chart, 1990 Edition) ranges from black (5Y 2.5/1) to light olive brown (2.5Y 5/3). Gravel clasts ranged from 2 - 15 millimeters, with quartz being the larger clasts. The permeability of the gravel is high due to the size of the clasts, the pore spacing, and the absence of cement.

## Sand

The sand is fine- to medium-grained, light brown (2.5Y 6/3) to dark grayish brown (2.5Y 4/2) with minor gravel at the base. Sand is moderately well rounded, moderately to poorly sorted, unconsolidated, containing quartz with minor feldspar, hornblende, biotite, and magnetite, with some organics. Sand is moist from approximately 3 feet below land surface to the bottom of the boring. The permeability of the sand is moderately high due to the pore spacing and lack of sediment-binding cement.



**Figure 9: NAWS Point Mugu Geologic Cross-Section**

### Silt

Silt is present from approximately 26 to 30 feet below land surface. Silt is olive to dark olive (5Y 4/3) with interbedded lenses of clay and fine- to medium-grained sand. Silt is distinguished from clay based on the adhesive nature of clay absent in the silt.

### Clay

Clay is dark olive gray (5Y 4/3) and interbedded with silt and sand. The clay is usually not pure and represents a minor portion of the total sediment present in the core logs. When the clay is separated from other sediment, it is tight, rolls into balls, and ribbons easily.

**Table 4: Permeability Values for Sediment at Site 5 Old Area 6 Shops**

Sample ID	Depth (in bls)	Depth (ft bls)	Avg. Permeability (cm/sec)
BMW 5-5	24-42	2-3.5	$1.48 \times 10^{-3}$
BMW 5-5	102-120	8.5-10	$1.32 \times 10^{-3}$
BMW 5-5	240-258	20-21.5	$1.22 \times 10^{-3}$
BMW 5-5	300-318	25-26.5	$9.43 \times 10^{-4}$
BMW 5-5	592-610	49.3-50.8	$1.92 \times 10^{-4}$
BMW 5-7	24-42	2-3.5	$2.31 \times 10^{-4}$
BMW 5-7	78-102	6.5-8.5	$1.34 \times 10^{-3}$
BMW 5-7	348-356	29-29.6	$4.32 \times 10^{-5}$
BMW 5-7	554-572	46.2-47.7	$1.45 \times 10^{-5}$

### **3.3.4 Hydrogeology**

The hydrogeologic framework of the NAWS Point Mugu facility is controlled in part both by sedimentation patterns in Mugu Lagoon and by late Pleistocene and Holocene sea level fluctuations. Five aquifers have been identified within the Pleistocene to Holocene age deposits in the vicinity of NAWS Point Mugu (PRC, 1993). These aquifers are referred to, in order of increasing depth, as the Semi-perched, Oxnard, Mugu, Fox Canyon, and Grimes Canyon aquifers. A sixth aquifer, the Hueneme, is typically present between the Mugu and Fox Canyon aquifers in the Oxnard Plain area but appears to be absent beneath NAWS Point Mugu (SCS and Landau Associates, 1985). In the area of Site 5 Old Area 6, the Semi-perched aquifer extends from the water table, approximately 10 feet bls, to an average depth of 75 feet bls throughout most of the area (PRC, 1993).

#### **3.3.4.1 Semi-Perched Aquifer and Clay Cap**

The Semi-perched aquifer is contained within Holocene age deposits. It extends from the water table (approximately 10 feet bls in the vicinity of NAWS Point Mugu) to an average depth of 75 feet bls over most of the Oxnard Plain (SCS and Landau Associates, 1985). However, in the vicinity of NAWS Point Mugu, it may extend to a depth of 150 feet bls (Fugro-McClelland,

1991). The aquifer is composed of fluvial, or river-deposited, sand and gravel interbedded with silt and clay.

Ground water in the Semi-perched aquifer is unconfined, and recharge occurs locally by surface infiltration and seepage from duck ponds north of the base and irrigation return canals (Fugro-McClelland, 1991). Brackish water conditions in the Semi-perched aquifer in the vicinity of NAWS Point Mugu may be the result of hydraulic communication with the surface waters of Mugu Lagoon, as well as infiltration of irrigation return water. Within the Oxnard Plain, the Semi-perched and Oxnard aquifers are separated by an aquitard known as the clay cap. The clay cap consists of silt and clay with lenses of fine- to medium-grained sand and attains a maximum thickness of 160 feet within the basin. The aquitard is considered to be relatively impermeable, although zones of relatively higher permeability may exist. Historically, subsurface investigations have not encountered the aquitard in the NAWS Point Mugu area (Fugro-McClelland, 1991). However, recent investigations by the U.S. Geological Survey (USGS) indicate that the aquitard is expected to be approximately 10 feet thick underneath NAWS Point Mugu (USGS, 1991).

#### **3.3.4.2 Oxnard Aquifer**

The Oxnard aquifer is located between 100 and 300 feet bls and consists of Holocene age fine- to coarse-grained sand and gravel. Interbedded silt and clay layers separate the aquifer into several zones. The Oxnard aquifer is considered to be the principal aquifer beneath the Oxnard Plain although it is actively becoming degraded by seawater intrusion. The Oxnard and Mugu aquifers are generally separated by an aquitard consisting of silt and clay of very low permeability and ranging in thickness from 10 to 100 feet. In the vicinity of NAWS Point Mugu, however, previous investigations have found the aquitard to be absent and the Oxnard and Mugu aquifers to be in direct hydraulic communication (Fugro-McClelland, 1991). Recent investigations by the USGS encountered this aquitard at a thickness of approximately 10 feet within the base boundaries (USGS, 1991).

#### **3.3.4.3 Mugu Aquifer**

The Mugu aquifer is defined within upper Pleistocene age deposits located approximately 300 to 500 feet bls. The aquifer is roughly 220 feet thick and is characterized by fine- to coarse-grained sand and fine gravel with local interbedded silt and clay. The aquifer has moderate to high hydraulic conductivity. Beneath the Mugu aquifer is an aquitard of silt and clay reportedly up to 200 feet thick (Fugro-McClelland, 1991). However, the aquitard is reportedly thin in the vicinity of NAWS Point Mugu (10 to 20 feet thick) and may be absent south of Mugu. Below the Mugu Aquifer are the Fox Canyon and Grimes Canyon aquifers. The Hueneme aquifer, which occurs beneath the Mugu aquifer in other portions of the basin, is apparently absent at NAWS Point Mugu (SCS and Landau Associates, 1985).

#### **3.3.4.4 Fox Canyon and Grimes Canyon Aquifers**

The Fox Canyon aquifer consists of 100 to 200 feet of fine- to medium-grained sand and gravel with interbedded silt and clay. The aquifer possesses moderate to high permeability and is considered to be the principal lower Pleistocene aquifer. A thin aquitard consisting of silt and clay separates the Fox Canyon from the underlying Grimes Canyon aquifer. However, the aquitard may not be laterally continuous, allowing hydraulic continuity between the two aquifers (SCS and Landau Associates, 1985). The Grimes Canyon aquifer consists of fine- to coarse-

grained sand and gravel and possesses moderate to high hydraulic conductivity. Only a few deep wells have reached the Grimes Canyon aquifer (SCS and Landau Associates, 1985).

### **3.3.5 Groundwater Occurrence**

The aquifers described above are generally organized into three groups based on differing potentiometric levels, water quality, and geologic structure (PRC, 1993). Usually, the Semi-perched aquifer is considered separately in evaluating ground water resources. The Oxnard and Mugu aquifers are referred to as the upper aquifer system. The Hueneme, Fox Canyon, and Grimes Canyon aquifers are referred to as the lower aquifer system (PRC, 1993). The regional aquifers are thought to be interconnected through sufficiently permeable aquitards that allow vertical as well as horizontal movement of ground water.

In addition, the upper aquifer system beneath NAWS Point Mugu may be hydraulically connected to submarine outcrops in the Pacific Ocean (PRC, 1993). Historically, ground water in the upper aquifer system occurred under confined conditions such that artesian flow occurred in wells near the coastal area of the basin. However, due to extensive pumping in the basin, this condition has reversed, and a landward gradient now exists (Figure 10) (Fugro-McClelland, 1991).

### **3.3.6 Surface Water Hydrology**

A discussion of surface water hydrology at NAWS Point Mugu requires consideration of two primary topics:

1. Freshwater inputs to the Mugu Lagoon from Calleguas Creek and Oxnard Drainage Ditches Numbers 2 and 3 (Figure 10).
2. The tidal influence of the tides flushing the lagoon water and its ground water influence (Figures 10 and 11).

Physical modifications to surface water flows and their effects on circulation also need to be considered. Mugu Lagoon is divided into three distinct areas - the western arm, the eastern arm, and the central basin - each of which responds in a different manner to water circulation and sedimentation events. Mugu Lagoon drains an area of approximately 325 square miles that includes mountainous areas and level floodplains in the southern portion of the Oxnard Plain (Steffen, 1982). The primary source of freshwater inflow into the lagoon is Calleguas Creek, its tributaries, and Revolon Slough (Figure 11). The surface soil in the Oxnard Plain is primarily alluvial and easily eroded by surface water flows (Steffen, 1982).

Surface water inputs to Calleguas Creek come from three sources: national pollution discharge elimination system (NPDES) permitted discharges, stormwater run-off, and agricultural return flows. Inputs from the 20 NPDES permitted discharges total approximately 31.7 million gallons per day (mgd) or 49.2 cubic feet per second (cfs), most of which readily percolates into the sediment of the creek beds before it reaches Mugu Lagoon (Birosik, 1993). Rainfall primarily occurs during the winter months: 92 percent occurring between November and April (Steffen, 1982).

Due to the arid conditions in the region, the flow in Calleguas Creek is highly responsive to rainfall events. Storm events result in rapid increases in stream flow. Peak flows in Calleguas Creek have been estimated for various storm intensities. Under the scenario for a two-year flood, maximum flow in Calleguas Creek is estimated at 2,500 cfs, while a ten-year flood results

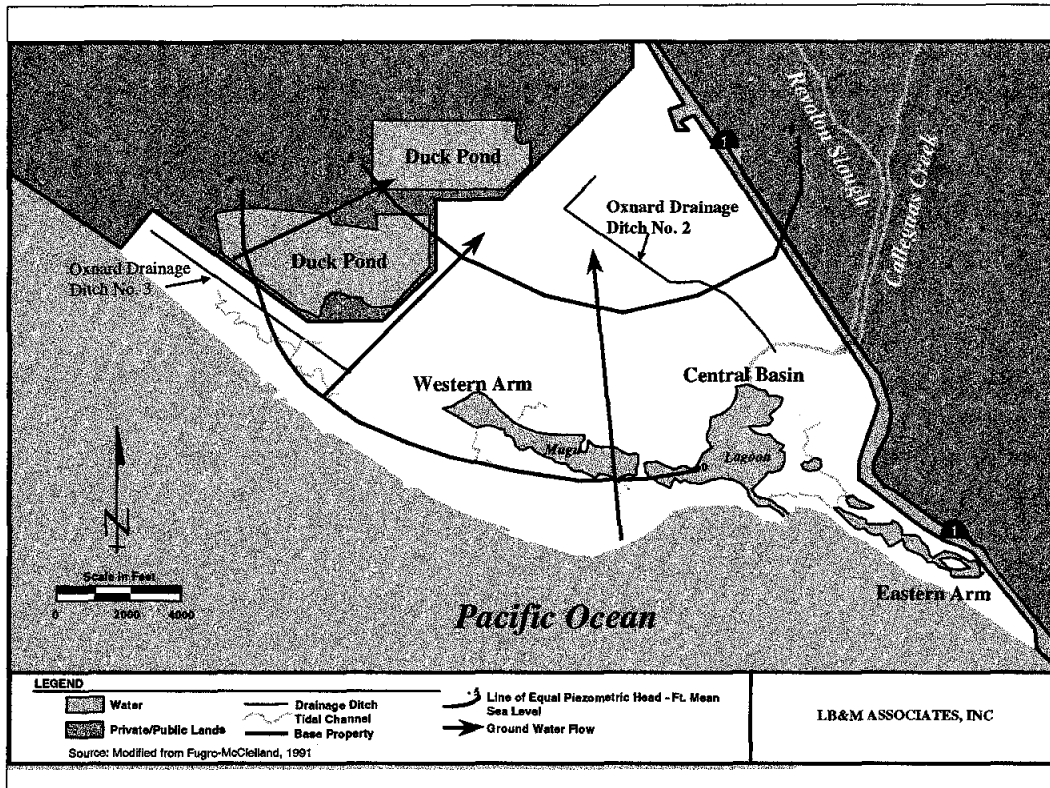


Figure 10: NAWS Point Mugu Groundwater Contour Map - Upper Aquifer

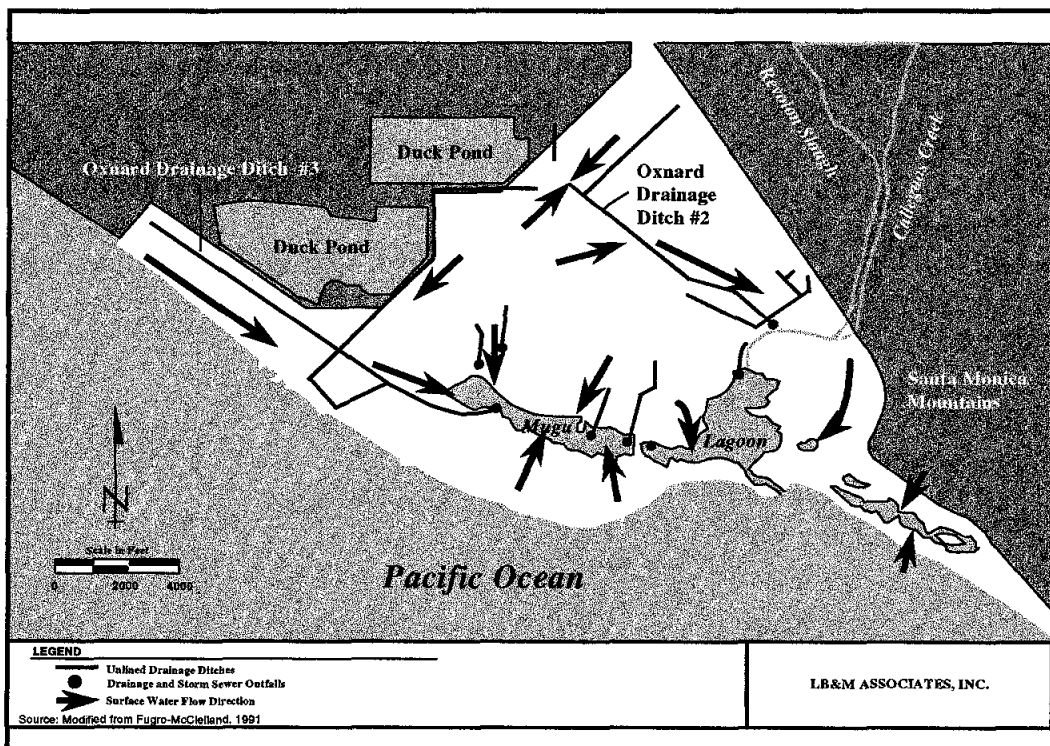


Figure 11: NAWS Point Mugu Surface Drainage Map

in a flow of 11,810 cfs into Mugu Lagoon (Simons, Li and Associates, 1989). Revolon Slough, which receives runoff from 38,200 acres of agricultural land (Steffen, 1982), joins Calleguas Creek just beyond the base boundary, approximately 1.5 miles from Mugu Lagoon (Figure 10). Flows in Revolon Slough have not been determined. Under normal conditions, the majority of the flow in the Calleguas Creek drainage area is due to agricultural irrigation-return flows.

Other freshwater inputs to Mugu Lagoon come from Oxnard Drainage Ditch No. 2, which joins Calleguas Creek on the installation, and from Oxnard Drainage Ditch No. 3, which drains into the western arm of the lagoon. Generalized drainage patterns and storm sewer outfalls at the base are shown in Figure 11. Flows in the ditches have not been determined.

Mugu Lagoon is connected to the Pacific Ocean via an opening through the barrier beach. Regular tidal exchanges influence water circulation patterns within the lagoon that, in turn, affect the transport, dilution, and residence times of contaminants entering the lagoon. The maximum tidal range measured within Mugu Lagoon is approximately 6 feet. The western and eastern arms are believed to have a significantly smaller range due to their limited inlets. Existing information indicates that the tidal prism, the volume of water moved in and out of the lagoon by the tides, is large compared to the volume of water retained in the lagoon during low tide. As a result, the lagoon remains a marine-dominated system. Tidal action is responsible for the flushing of water and sediment in and out of Mugu Lagoon. However, there is considerable variability in the degree of flushing with the lunar tidal cycle and storm surges in the lagoon. Predominant southeast flowing longshore currents ensure that very little water and material leaving the lagoon during ebb tides reenters the lagoon on the following flood tide (Onuf, 1987). The relatively large exchange of water from Mugu Lagoon with the tides creates rapid currents at the narrow opening to the Pacific Ocean with water velocities measured at approximately 6 miles per hour at the opening (Onuf, 1987).

#### **3.3.6.1 Site-Specific Surface Water Hydrology - Site 5 Old Area 6 Shops**

Surface water bodies within Site 5 Old Area 6 include an inter-tidal channel and the two former waste lagoons. The water level fluctuation observed in the lagoons during tidal changes is slight (less than 2 inches of vertical increase or decrease), and the change lags the tide by approximately one hour. Fluctuations in the tidal creek are surficial and relatively shallow in the tidal channel. Therefore, tidal effects within the former waste lagoons or in either of the two test cells are considered minor and not expected to interfere with the horizontal movement of the electroosmotic flow or electromigration.

## **4.0 Demonstration Approach**

### **4.1 Performance Objectives**

The objective of this demonstration was to evaluate the ability of electrokinetic remediation to extract heavy metal contaminants from impacted soil and sediment at NAWS Point Mugu. The demonstration was designed to identify and verify the economic, operational, and performance data that will be used to assess its use at NAWS Point Mugu and to validate and transfer this technology to other potential users. The major factors being evaluated were performance and costs. Identification of site-specific characteristics affecting the performance and cost was also a consideration of this technology demonstration. Also, the validation of the laboratory treatability study predictions was a major consideration due to its importance in implementing the technology at sites with varying geological, hydrogeological, and contaminant characteristics. Following are the evaluation issues addressed by the demonstration:

#### **4.1.1 Treatability Study Validation**

The ERDC treatability studies conducted to support this demonstration provided indications of the affinity for contaminant mobility and removal efficiency (Bricka et al., 2000). Extrapolation of the treatability study information to make accurate field treatment efficiency, duration, and cost predictions was not possible, however, the studies did provide a general scenario of how the technology was expected to perform in the field. Based on the study results, pH front development between the electrodes was expected to be measurable within the first 3 months of operation and significant contaminant removal was expected by the end of the 9-month field demonstration period. Comparison of the laboratory treatability study results to field results will consist of a subjective comparison of data to assess the validity of laboratory study methods in predicting field performance.

#### **4.1.2 Performance Assessment**

The performance of electrokinetic remediation will be assessed based on its ability to reduce contaminant levels to meet regulatory requirements that are protective of human health and the environment. Also, the effects that the use of the technology has on the environment will be monitored and its impacts assessed. The technology performance assessment will be performed as follows:

**4.1.2.1** The ability of the electrokinetic technology to reduce metal contaminant levels in soil to below state and federal regulatory action levels for metals concentration and toxicity criteria will be determined. Post treatment sample analyses will be compared to established concentration and toxicity criteria. Successful treatment will be considered achieved when site soil contaminant levels are reduced to levels specified by the California state TTLC and STLC levels and the TCLP toxicity criteria.

The ability of the electrokinetic technology to achieve remediation goals that are based on human health risk and site background levels will also be assessed. Post treatment sample analyses will be compared to established Modified USEPA Region 9 PRGs that are based on human health risk assessments and established site background levels.

**4.1.2.2** The ability to control the effects of the electrokinetic remediation technology in both an artificially confined and an unconfined treatment area. For this study an artificially confined



treatment area was defined as an area around which a non-conductive barrier wall had been installed to mitigate the influences of groundwater flow and tidal effects on the electrokinetic remediation process. The unconfined treatment area was open to groundwater and tidal effects. During the technology demonstration monitoring was conducted to verify the electric field effects and the control of contaminant migration and emissions was contained within the defined treatment area. Indications of field effects (i.e. pH changes or heating) or contaminant migration outside of the defined treatment area would indicate a loss of control of the technology's effects on the environment.

**4.1.2.3** Identification and control of gases produced at the electrode wells will be assessed to ensure operation of the electrokinetic remediation technology does not result in emissions that are detrimental to human health and the environment.

**4.1.2.4** The effects of the electrokinetic remediation technology on contaminants other than the target heavy metals will be assessed. Monitoring of a broad range of contaminants will be conducted to detect emissions or migration that may be attributed to the use of the technology.

**4.1.2.5** The effects of the technology on site biota will be assessed by comparing a baseline characterization of the biota to a post treatment characterization of the biota.

**4.1.2.6** The potential to recycle the heavy metal waste material extracted by the electrokinetic remediation technology will be assessed by characterizing the waste and assessing its recycling potential with commercial recyclers.

**4.1.2.7** An assessment of site-specific characteristics affecting the performance of the technology will be performed by reviewing collected data, comparing it to expected performance, and subjectively identifying and assessing the impact of potential retarding factors affecting the technology.

#### **4.1.3 Cost Assessment**

The turnkey costs associated with the use of the electrokinetic remediation technology to extract heavy metals from soils will be determined by quantifying the capital, operational, maintenance, and disposal costs required to treat the volume of soil at NAWS Point Mugu. Any site characteristics that may be affecting these costs will be subjectively identified and their impact on the costs will be estimated.

#### **4.1.4 Safety Assessment**

Safety issues related to the use of the electrokinetic technology will be subjectively assessed based on documented incidents occurring during the performance of the demonstration and a review of the process fugitive emissions (i.e. hydrogen, oxygen, or chlorine gas). Site characteristics that may affect the safe operation of the technology will be identified.

#### **4.1.5 Regulatory Acceptance**

The public and regulatory acceptance of the electrokinetic remediation technology will be assessed by interviews with the regulatory officials involved and questionnaires requesting feedback from the public on potential concerns or issues with the technology.

### **4.2 Physical Setup and Operation**

Site preparation to implement the use of the electrokinetic remediation technology is typically minimal. However, in order to establish a means of monitoring the performance of the

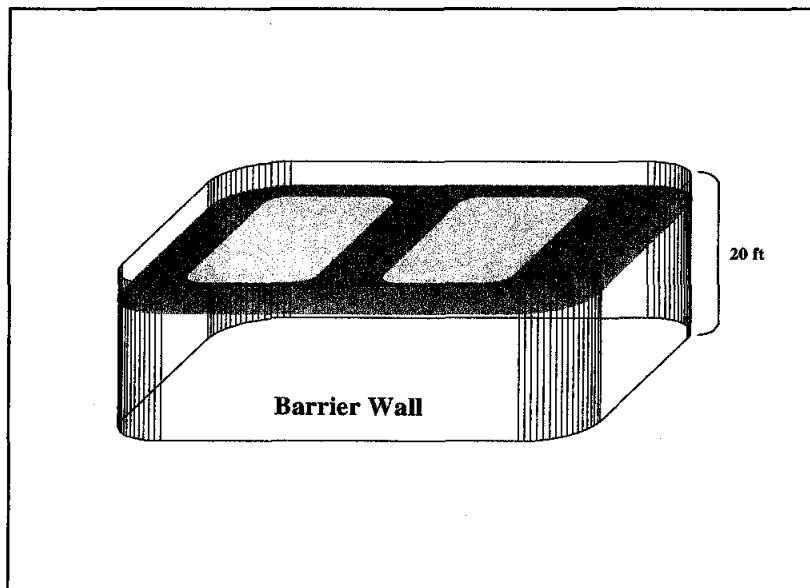
technology and verify that control of the contaminant migration and electric field effects could be maintained, extensive site preparation was needed to establish the demonstration test cells. Those structures required specifically for this demonstration setup and monitoring will be identified and described first, then the requirements specific to the use of the technology will be described.

#### **4.2.1 Demonstration Setup.**

The technology demonstration at Site 5 Old Area 6 Shops, NAWS Point Mugu required the following structures to be constructed prior to initiation of technology operations:

##### **4.2.1.1 Barrier Wall Installation**

Demonstration setup involved the delineation of two test cells, one confined test cell (test cell #1) and one unconfined test cell (test cell #2). For this study an artificially confined test cell was established by installing an electrically non-conductive, 100 mil-thick, high-density polyethylene (HDPE) barrier wall to a depth of approximately 20 feet around the two waste lagoons (Figure 12). The barrier wall was installed to mitigate the influences of groundwater flow and tidal effects on the electrokinetic remediation process. It would prevent the movement of mobile species outside of the test cell treatment area in the event the electrokinetic process could not control the movement of the mobilized metals. The barrier wall was constructed of HDPE panels with single channel male and female interlocks on the panel edges. A hydrophilic sealing rubber, in the form of a small diameter cord was placed in the female interlock during installation. On contact with water, the hydrophilic rubber swells to force the panel interlock surfaces together and make a watertight seal. Both the panels and the sealing material were non-reactive and environmentally safe material (Witham, 1998).



**Figure 12: Barrier Wall Schematic**

##### **4.2.1.2 Enclosure Installation**

Tidal salt marsh and wetlands surround these lagoons. The wetlands are inhabited by the light-footed clapper rail, a federally- and state-listed endangered species. No noisy or intrusive work

was allowed between 15 February and 15 September to avoid interfering with the mating season of the light-footed clapper rail. Because of the presence of this endangered species, precautions had to be taken to ensure the frequent sampling operations that would take place during the demonstration did not impact the nesting of the clapper rail. To accomplish this a temporary enclosure (Figure 13) was constructed over the test area. Clamshell Buildings, a California-based company, designed and erected the enclosure over the two test cells. The enclosure was a four-sided, 7-foot high frame covered with a dark, tightly woven fabric mesh screen. The enclosure frame was attached to cement-filled tires with heavy-duty, nonconductive eyebolts. The combined weight of the tire base and the enclosures was sufficient to restrict the movement of the structure during inclement weather. The enclosure served to shield the birds from any disturbance by personnel movement in the area and restricted the bird's access into the test area. Under a normal implementation of electrokinetic remediation, frequent sampling operations would not be required, thus the potential disturbance to the endangered species would not exist and the enclosure would not be required.



**Figure 13: Temporary Enclosure**

#### **4.2.1.3 Piezometer Well Installation**

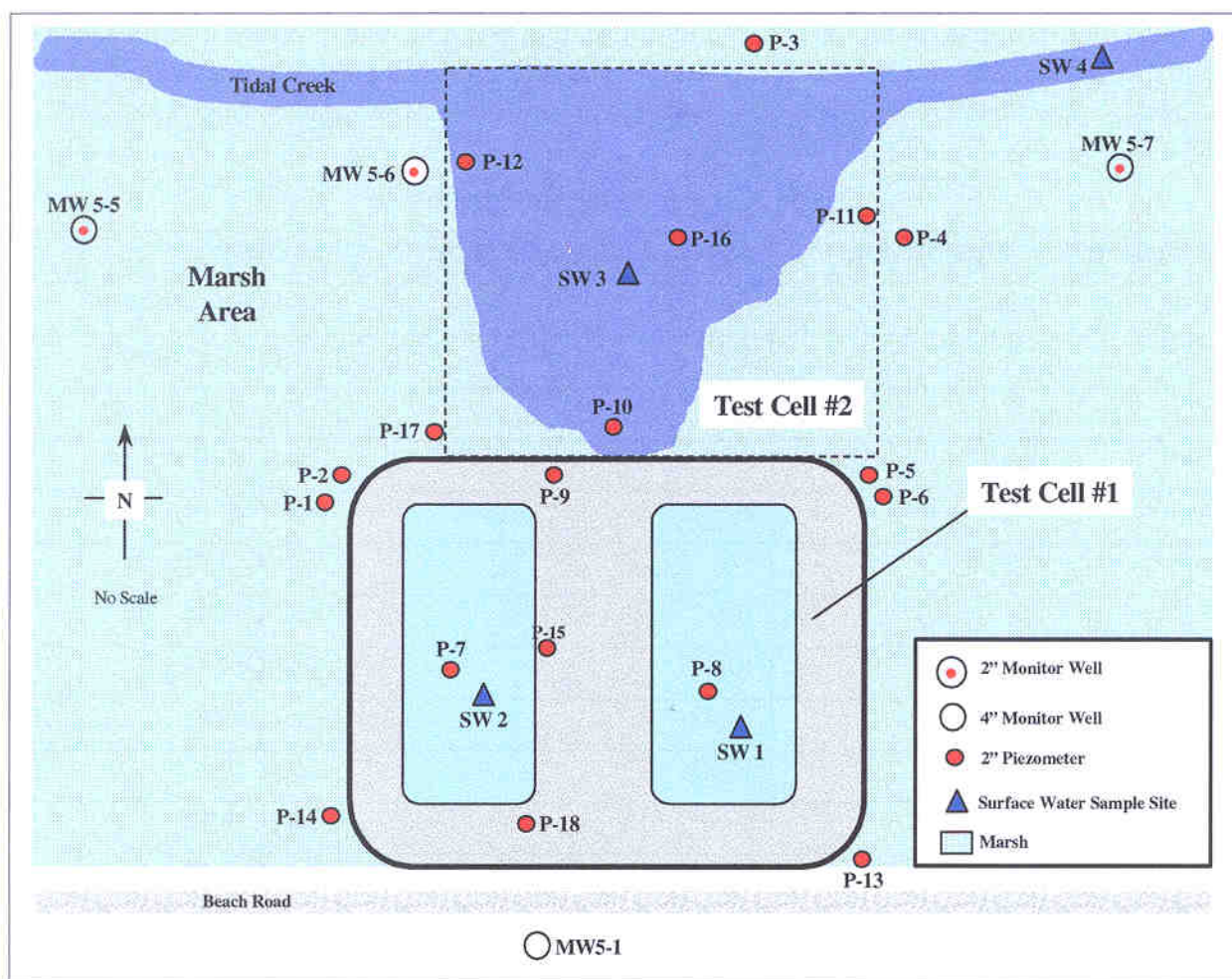
Frequent and extensive monitoring during the operation of the electrokinetic remediation process was necessary to assess the technology's ability to control the formation and mobility of contaminants within a defined area. In order to conduct this monitoring, 18 two-inch diameter piezometer wells were installed in and around the test cells. These wells were sampled to detect electric field effects and/or the dispersal of contaminants outside of the defined treatment area.

The wells were screened at various depths and located in positions where contaminant transport or electric field effects would most likely occur if the electrokinetic process control could not be maintained. The installation data for the wells are presented in Table 5 and located as shown in Figure 14.

**Table 5: Piezometer Information**

<b>Piezometer</b>	<b>Depth (feet bls)</b>	<b>Screened Interval (feet bls)</b>	<b>Location</b>
P-1	22	20-22	Test Cell Periphery
P-2	5	3-5	Test Cell Periphery
P-3	5	3-5	Test Cell Periphery
P-4	5	3-5	Test Cell Periphery
P-5	22	20-22	Test Cell Periphery
P-6	5	3-5	Test Cell Periphery
P-7	12	10-12	Test Cell #1
P-8	12	10-12	Test Cell #1
P-9	22	20-22	Test Cell #1
P-10	22	20-22	Test Cell #2
P-11	10	8-10	Test Cell #2
P-12	22	20-22	Test Cell #2
P-13	22	20-22	Test Cell Periphery
P-14	22	20-22	Test Cell Periphery
P-15	5	3-5	Test Cell #1
P-16	5	3-5	Test Cell #2
P-17	18	16-18	Test Cell Periphery
P-18	22	20-22	Test Cell #1





**Figure 14: Piezometer Locations**

## 4.2.2 Electrokinetic System Installation

The electrokinetic system installation consisted of routing of required utilities (i.e. electricity, water, telephone lines) to the site and the installation of the electrokinetic remediation system electrode arrays, controls, and support equipment. The electrokinetic system installation was conducted as follows:

### 4.2.2.1 Utility Installation

The electrokinetic system, as designed by Lynntech, Inc., required a 220-volt, 100 amp, 3-phase power supply. The power supply to operate the electrokinetic system was based on Lynntech's estimate of the power required to be applied to the electrode arrays and to operate the control system and support equipment. Electrical power from a nearby power line was routed above ground to a fused-disconnect switch at the demonstration site. The power supply was metered to accurately monitor the electrical power usage of the electrokinetic system and its support equipment.

A fresh water supply was required to provide make up water to the electrode wells. A volume of 35 liters per day was estimated to operate the electrokinetic system. A metered water line for the



technology demonstration was connected to a fire main and routed to the demonstration site. The meter was used to monitor the water used to support the electrokinetic system operations.

The electrokinetic remediation system was remotely monitored and controlled from Lynntech's home office in College Station, Texas via computer modem. Communications requirements to support site operations were 2 telephone lines. Telephone lines were routed to the site from a nearby telephone service pole.

#### **4.2.2.2 Electrokinetic Remediation Equipment Installation**

Lynntech installed the electrokinetic remediation system as described in section 2.1.2. The electrode wells were installed within test cell #1 to a 12-foot depth (Figure 15). The bottom 2 feet of each well was plugged with kaolinite. The wells were installed using standard well drilling and casing installation practices. The treatment depth within test cell #1 was 10 feet. The electrodes that were hung in the anode and cathode wells extended the entire treatment depth.



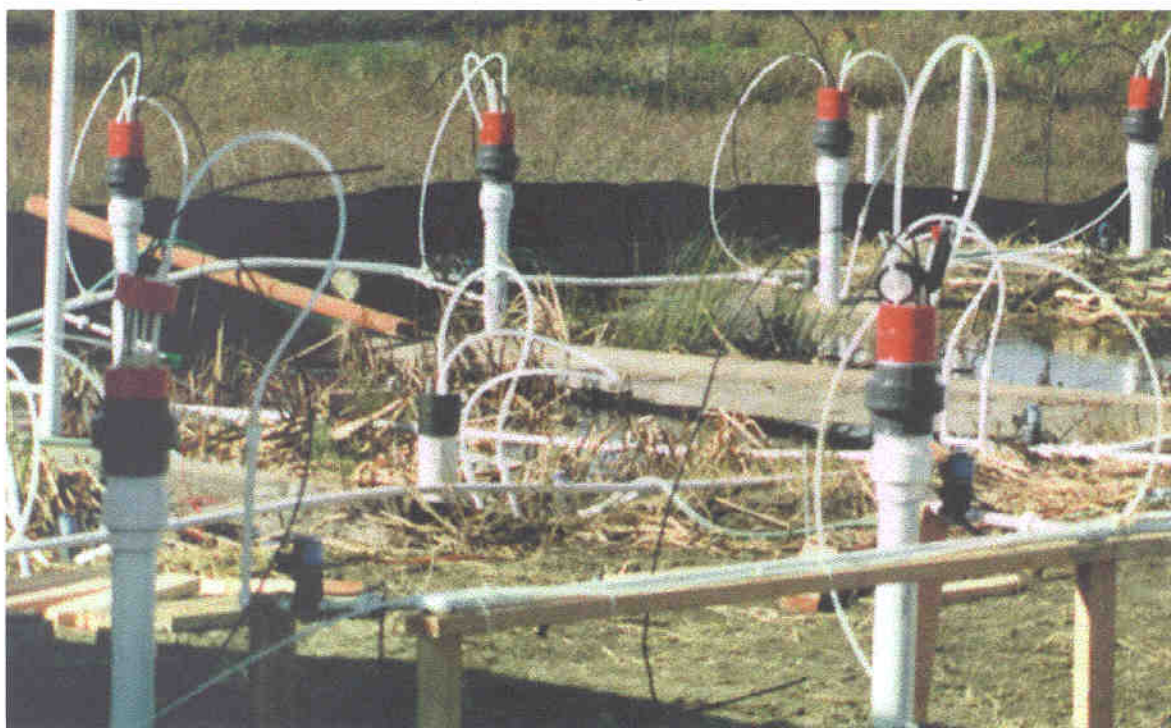
**Figure 15: Test Cell #1 Electrode Wells Installed**

The control trailer, which housed the power distribution and control system, was located adjacent to the test cell on relatively higher ground to prevent any potential flooding impacts on the equipment (Figure 16). Utilities were routed to an area within 20 feet of the trailer location.

The process piping and electric cable was routed to and installed on each well (Figure 17). The piping and cable were supported approximately 2 feet above ground to minimize potential flooding impacts on the equipment. The acid, water, base, and effluent tanks were located approximately 50 yards from the test area. This area was also relatively higher than the surrounding marsh to minimize potential flooding impacts on the equipment.



**Figure 16: Control Trailer**



**Figure 17: Process Piping and Electric Cable Installed**



### 4.2.3 Electrokinetic Remediation System Operation

The electrokinetic remediation system was installed in test cell #1 and ready for operation by 15 March 1998. The system was designed to operate for nine months or until the contaminant levels were reduced to below regulatory action levels for metals concentration and toxicity criteria.

Lynntech's personnel monitored the system's daily operation either on-site or remotely from its home office in Texas, supervised the delivery and storage of process chemicals, and made necessary changes to the system's operation based on its monitored performance. Lynntech remotely monitored the following basic operating parameters:

- Voltages and currents across the electrode array
- Electrode well pH
- Soil temperature
- Fluid levels in the storage tanks

These parameters were monitored to ensure the system was operating within desired specifications and to determine when maintenance was necessary. The goal of remote monitoring and operation was to minimize field labor and travel requirements. The initial operating parameters were established based on Lynntech's prior field experience and limits negotiated with regulatory officials on environmental effects resulting from operation of the system. Table 6 summarizes these parameters. During the conduct of the demonstration, the current density was increased to accelerate electrokinetic remediation performance. The changes made to the current density and the system design during the demonstration are documented in section 4.2.3.1.

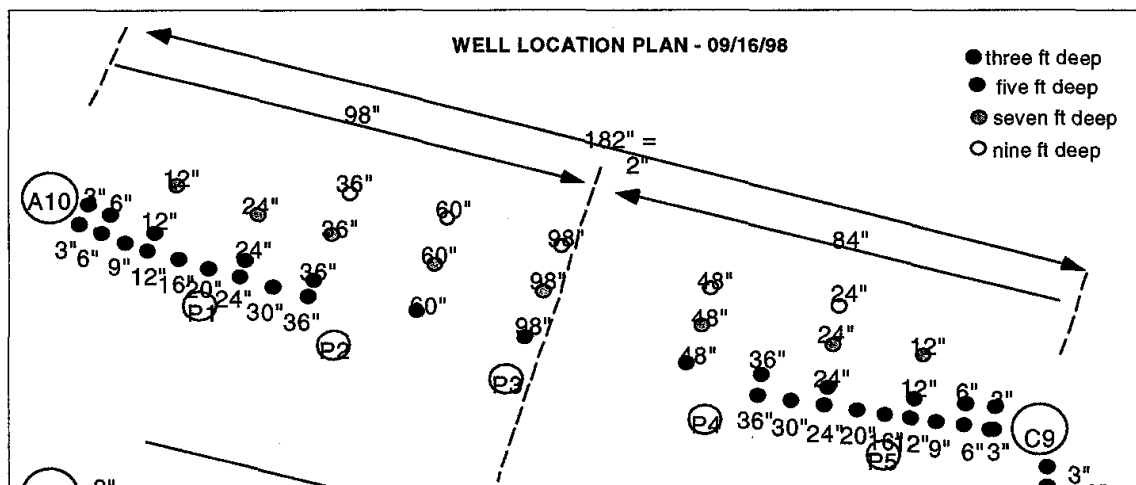
**Table 6: Basic Operating Parameters**

Parameter	Specification
Current Density	0.1 mA/cm <sup>2</sup> (initially)
pH	Anode Well – 1.0 Cathode Well 4.0
Soil Temperature	> 40 °C increase above background
Storage Tank Fluid Level	As required to prevent interruptions of system operation.

To monitor the electrokinetic systems' progress in mobilizing the metal contaminants, process control zones were established within the test cell (Figure 18). These zones were monitored on a monthly basis to track changes in contaminant concentrations at discrete locations between representative pairs of anode and cathode wells. Initially, soil core samples were collected monthly and analyzed for cadmium and chromium concentrations. After approximately 3 months of operation, ½" diameter wells were installed in the process control zone to monitor pH changes in the pore fluid and concentrations of mobilized contaminants in the pore fluid. These wells were installed due to the lack of performance observed during the first 3 months of



operation. The chronology of system operation and observed performance will be discussed in section 4.2.3.1.



**Figure 18: Process Control Zone Sampling Points**

#### 4.2.3.1 Electrokinetic Remediation System Operation Chronology

Operation and monitoring of test cell #1 was initiated in March 1998 and continued until October 1998 with a temporary shutdown for 6 weeks from the end of June through mid-August due to contractual issues with Lynntech, Inc. In May 1998, a 3-month progress review was held. It was determined that electrokinetic extraction was progressing much slower than originally expected. There was no contaminant movement, and the pH front in the soil had not developed. The pH front had been expected to be observed based on the laboratory trials conducted at ERDC and Lynntech. The program review revealed that the current densities used in the bench scale studies ( $0.5 \text{ mA/cm}^2$  [ERDC] and  $2.3 \text{ mA/cm}^2$  [Lynntech]) were much higher than those used in the field demonstration (initially  $0.1 \text{ mA/cm}^2$  and increased to approximately  $0.2 \text{ mA/cm}^2$ ). The current density was changed from  $0.1 \text{ mA/cm}^2$  to  $0.2 \text{ mA/cm}^2$  two weeks prior to the 3-month progress review. In an effort to increase the rate of contaminant movement, the power applied to test cell #1 was increased further. To achieve a power increase with the existing equipment, the treatment area within test cell #1 was reduced by approximately one half so that treatment was applied to only the east waste lagoon. The current density was increased from  $0.2 \text{ mA/cm}^2$  to more than  $0.33 \text{ mA/cm}^2$  in the reduced test area. The reduced electrokinetic extraction system was operated for an additional 10 weeks.

In total, the system operated for 22 weeks. At the end of this 22-week period, the pH front was just beginning to appear and low contaminant concentrations were detected in some of the electrode wells. Another progress review was conducted at this point, and it was determined that unknown factors (either system design or site soil characteristics, or both) were retarding the performance and that the technology required further investigation and development prior to full-scale implementation. On 7 October 1998, the field demonstration at Site 5 was suspended. The data supporting this decision will be presented in Chapter 5. The treatment timeline for the

demonstration is summarized in Table 7. Operations within test cell #2 were never initiated due to the performance problems observed in test cell #1.

**Table 7: Treatment Timeline for Test Cell #1**

Activity	Time Period	Comment
Operations and maintenance begun	March 1998 to end-June 1998	Initial operations (1/8 acre, 0.1 - 0.2 mA/cm <sup>2</sup> )
Three-month progress review	May 1998	- No contaminant movement and pH front had not developed - Increased current density and reduced treatment area (1/16 acre, 0.33 mA/cm <sup>2</sup> )
Temporary shutdown	end-June 1998 to mid-August 1998	Shut down due to contractual issues with Lynntech, Inc.
Operations and maintenance resumed	mid-August 1998 to October 1998	pH front just beginning to develop. Low contaminant concentrations detected in some electrode wells.
Progress review	October 1998	Unknown factors were retarding performance. Determined that the technology required further investigation.

In January 1999, ERDC resumed operation of the electrokinetic extraction system in test cell #1 to attempt to identify the factors that may be retarding the performance of the technology and to improve design and operational parameters. At this point, the technology's potential for use at the NAWS Point Mugu site was still considered possible if the factors retarding the process could be identified and addressed. This was based on the limited performance that had been observed prior to system shutdown in October 1998. To reduce operational costs, the treatment area was again reduced, consisting of six anode electrodes and three cathode electrodes (Figure 19). The current density was increased from 0.33 mA/cm<sup>2</sup> to 1.0 mA/cm<sup>2</sup> in the reduced test area. Results from the continued operations conducted by ERDC will be presented in future ERDC reports.


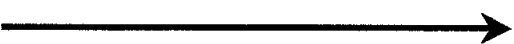



Section 2.1.2.6 describes the planned method for handling process waste via the contaminant recovery and disposal system. However, as a result of the poor performance of the technology during the March through October 1998 demonstration period, no process waste was generated. All investigative derived waste (IDW) generated during the demonstration period and during ERDC's follow on efforts was stored, sampled and disposed of in accordance with all state and federal regulatory requirements. Advancia and ERDC prepared all documents related to the disposal of IDW waste generated by the technology demonstration. NAWS Point Mugu signed manifest documents as the waste generator.

Two separate sampling programs were conducted during the demonstration, each with different functions. Lynntech, Inc., the technology vendor, established process control zones as described in section 4.2.3 to monitor the establishment of the pH front and movement of contaminants between the anode and cathode wells. This monitoring along with periodic sampling of the electrode wells for cadmium and chromium concentrations was strictly for monitoring process operations and identifying any potential concerns with the efficiency of the contaminant extraction during system operation. The sampling program conducted by Advancia Corporation

for USAEC was designed to collect the data necessary to address the demonstration performance objectives identified in section 4.1. The initial planned sampling analytes and frequency is summarized in Table 8. The Advancia sampling program and its modifications are described below. Specific details of the sampling program can be found in the Technology Demonstration Plan (USAEC, 1998).

**Table 8: Sample Locations, Intervals, and Analytes**

SAMPLE TYPE	TWICE MONTHLY			
Groundwater <sup>1</sup>	CA List Metals <sup>2</sup> , Cr <sup>+6</sup> , pH, organics			
Surface Water <sup>3</sup>	CA List Metals <sup>2</sup> , Cr <sup>+6</sup> , pH, organics			
		MID POINT 1 <sup>4</sup>	MID POINT 2 <sup>5</sup>	FINAL
Soil	Cr <sup>+6</sup> , Total Cr, Cd, Ag, Ni, Cu, pH, soil moisture			

1. Monitor wells MW5-1, MW5-5 and piezometers P-1 through P-18 in Figure 19.

2. California (CA) List Metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc

3. Surface water refers to water in the former waste lagoons, the tidal creek, and up stream from the site.

4. After three months of operation

5. After six months of operation

### 4.3.1 Advancia Sampling Program

The primary focus of the Advancia sampling effort was to quantify the metal contaminants extracted from the soil by electrokinetic remediation, to establish the technology's limits for removal of contaminants from the treatment area, and to assess the technology's ability to control metal contaminant movement and electric field effects within the defined treatment area.

#### 4.3.1.1 Effluent Sampling

Quantification of the mass of metal contaminants extracted from the soil was to be accomplished by sampling and characterizing the effluent (or process waste) extracted from the electrode wells. The mass of the individual contaminant would be determined by multiplying the measured concentration by the volume of effluent. This was not performed however since no effluent was extracted from the electrode well during the demonstration.

#### 4.3.1.2 Soil Sampling

Establishment of the technology's limits for removal of contaminants from the treatment area was to be accomplished by soil surface and core sampling prior to, during, and after the demonstration period. Initially, the planned soil surface and core sampling consisted of two midpoint sampling events and a final sampling event that would be compared to the initial site characterization sampling results. The midpoint and final surface and core samples would be collected at locations co-located with the initial site characterization sample locations within test cell #1 (Figure 8). Sample analyses would consist of establishing the concentrations of the California list of toxic metals, chromium VI concentrations, and pH from each well in the test

cell. Volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC) would also be analyzed in select samples to monitor for any changes in their concentrations from the baseline sampling. Changes in the metals concentrations with respect to time would give an indication of the mobility of metal contaminants at random locations in the treatment area. The final sampling would provide an indication of the lower limits to which the technology was capable of removing the contaminants under the site conditions present at NAWs Point Mugu as well as its contaminant removal efficiency.

Due to poor system performance, the midpoint soil sampling events were suspended until ground water and surface water data confirmed pH front development and contaminant movement. Since sufficient contaminant movement was not detected during the demonstration period, Advancia conducted no soil sampling events in support of the technology evaluation. Only groundwater and surface water sampling was conducted as described below.

#### 4.3.1.3 Surface Water and Groundwater Sampling

Surface water and groundwater samples were collected primarily to assess the technology's ability to control metal contaminant movement and electric field effects within the defined treatment area. Prior to initiating electrokinetic remediation system operations, eighteen 2-inch diameter piezometer wells were installed throughout the treatment areas defined as test cells #1 and #2 (Figure 19). These wells were screened at varying depths (Table 5) and located in areas where contaminant transport or electric field effects would most likely occur if they could not be controlled by the system. The baseline groundwater and surface water sampling locations and analytes are summarized in Table 9.

**Table 9: Baseline Groundwater and Surface Water Sampling**

SAMPLE LOCATION	SAMPLE ANALYSES
P-1 through P-18, MW5-1, MW5-5, MW5-6, and MW5-7	pH, Cr <sup>+6</sup> , COC Metals <sup>1</sup>
P-8, 10, 11, 15, 16, 18	VOC, SVOC
Lagoons 1 & 2 and Tidal Creek	pH, Cr <sup>+6</sup> , COC Metals

1. Contaminants of Concern (COC) metals are Cr, Cd, Ag, Ni, Cu, and Pb.

Initially, surface and ground water sample collection was scheduled over the duration of the project at semimonthly intervals. The sampling was conducted the first and third weeks of each month. The semimonthly groundwater and surface water sampling locations, analytes, and frequencies are summarized in Table 10. The sampling locations identified are specific to monitoring test cell #1 operations. Sampling of the remaining piezometer and monitoring wells was to begin when operations in test cell #2 were initiated. Operations in test cell #2 were not initiated due to the performance problems experienced in test cell #1. Each sampling event determined the pH and the presence of Cr<sup>+6</sup>. These analyses were performed frequently because pH changes outside of the treatment area would be a leading indicator of stray electric field effects or loss of control of ion transport. Also, the presence of Cr<sup>+6</sup> contaminants would be a leading indicator of loss of control of contaminant transport due to its potential for rapid movement when compared to Cr<sup>+3</sup> compound mobility. Once each month, sampling to determine



the COC metals was also performed to ensure that no other primary contaminants were mobilized outside of the treatment area.

**Table 10: Groundwater and Surface Water Sampling (Test Cell 1 Operation)**

SAMPLE LOCATION	SAMPLE ANALYSES	SAMPLE INTERVAL
P-1, 2, 5, 6-8, 9, 10, 13-15, 17, 18, MW5-1, MW 5-6	pH, Cr <sup>+6</sup>	First week of each month
P-1, 2, 5, 6-8, 9, 10, 13-15, 17, 18, MW5-1, MW5-6	pH, Cr <sup>+6</sup> , COC Metals	Third week of each month
Lagoons 1 & 2 and Tidal Creek	pH, Cr <sup>+6</sup>	First week of each month
Lagoons 1 & 2 and Tidal Creek	pH, Cr <sup>+6</sup> , COC Metals	Third week of each month

The treatment area in test cell #1 was reduced to increase the power applied to the remaining operating electrode wells after the 3-month review in June 1998. This was the result of the slow progress of the pH front development and metals mobilization. With the reduction of the treatment area, the following changes to the sampling frequency and locations were executed:

- The number of piezometer wells sampled in and around test cell #1 was reduced.
- The frequency of groundwater and surface water sampling was reduced to a monthly sampling event.

The revised groundwater and surface water sampling locations, analytes, and frequencies are summarized in Table 11.

**Table 11: Revised Groundwater and Surface Water Sampling (Reduced Test Cell 1 Operation)**

SAMPLE LOCATION	SAMPLE ANALYSES	SAMPLE INTERVAL
P-5, 6, 8, 9, 10, 13, 15, 16, 18	pH, Cr <sup>+6</sup>	Monthly
P-5, 6, 8, 9, 10, 13, 15, 16, 18	COC Metals	September, December (3 month intervals)
P-8, 10, 18	VOC, SVOC	September, December (3 month intervals)
Lagoon 1	pH, Cr <sup>+6</sup>	Monthly
Lagoon 1	COC Metals	September, December (3 month intervals)

After the September 1998 sampling event, the system was evaluated for pH front development, contaminant movement and control. At this point, the pH front was just beginning to appear and low contaminant concentrations were detected in some of the electrode wells. Another progress review was conducted and it was determined that unknown factors (either system design or site

soil characteristics, or both) were retarding the performance and that the technology required further investigation and development prior to full-scale implementation. On 7 October 1998, the field demonstration at Site 5 was suspended. In January 1999, ERDC resumed operation of the electrokinetic extraction system in test cell #1 and continued the sampling described in Table 11. The results of the ERDC sampling will be presented in future ERDC reports.

#### 4.3.1.4 Supplemental VOC Monitoring

Additional VOC sampling was conducted using GoreSorber® modules. These sampling modules are passive sensing elements constructed of a hollow insertion/retrieval cord. Inside the cord are smaller, hollow tubes filled with sorbent material and sealed at both ends. Organic vapors transfer through the insertion/retrieval cord and into the sorbent-filled collectors. Following retrieval, the modules are analyzed for organic compounds detected in the vapor phase. GoreSorber® modules were placed in and around the electrode wells for organic compound detection in March and July 1998. This monitoring was conducted to assess the effects, if any, that the electrokinetic remediation system might have on any existing VOC contaminants on site. The expected effect, if VOC's were present, was that some volatilization of the VOC's might occur if soil heating resulted from the application of the electric field. If this occurred the volatilized gases may collect in the headspace of the wells. Based on the low concentrations of VOC's detected during the initial site characterization and the minimal soil heating expected during system operation, no VOC's were expected to be detected.

#### 4.4 Analytical Procedures

The analytical procedures used are summarized in Table 12.

**Table 12: Analytical Procedures**

Sampling Matrix	Sampling Parameter	US EPA Analytical Method
Soil	Cr, Cd, Cu, Ni, Ag	SW846 6010
Soil/Water	pH	SW846 9045
Soil	Chromium Speciation	SM 3500-Crd
Soil/Water	Total California List Metals	SW846 6010/7000
Soil	California WET Metals	SW846 6010/7000
Soil	TCLP RCRA Metals	SW846 1311/7000
Soil	Volatiles	SW846 8240
Soil	Semi-volatiles	SW846 8270
Soil	Polynuclear Aromatic Hydrocarbons	SW846 8310
Soil	Pesticides	SW846 8080

## **5.0 Performance Assessment**

The electrokinetic remediation project at NAWS Point Mugu was designed to serve two purposes. It was to serve as a demonstration project to assess the performance, cost, and viability as a potential cleanup technology at DoD's various metals contaminated sites and to serve as a treatability study to assess its potential use as a cleanup technology for the metal contaminants specifically at Site 5. The project objectives described in Chapter 4 identified evaluation points that would be used to address both of these purposes. Due to complications observed during the technology demonstration, the focus of ERDC's continuing field investigations has been changed to assessing the technology's potential use as a cleanup technology specifically for Site 5 at NAWS Point Mugu. ERDC shall assess the technology's potential for use at NAWS Point Mugu in future reports. Its widespread use within the DoD is considered to be limited at this point as a result of the observed design and performance issues encountered during the demonstration. In this chapter, a chronological review of the site activities and collected data will be presented. The design and performance issues that arose will be identified.

### **5.1 Performance Data**

As described in chapter 4, two separate sampling programs were conducted during the demonstration, each with different functions. The sampling conducted by Lynntech, Inc. in the established process control zones was intended to serve as a process monitoring and optimization tool. This data was not intended to be used to address performance objectives described in chapter 4. Some of this data will be presented here primarily in graphical form to explain the observed performance issues and the reasons for the follow on activities conducted by ERDC. Also, this data was the basis for the changes in the sampling program conducted by Advancia Corp. The sampling program conducted by Advancia Corp. for USAEC was designed to collect the data necessary to address the demonstration performance objectives identified in chapter 4. This data is presented in full in Appendices C, D, and E. It covers the monitoring period from March 1998 to October 1998. All initial site characterization data is documented in a separate USAEC Technical Data Report (Report #SFIM-AEC-ET-CR-97039, August 1997). The modified sampling program, in addition to the process control zone monitoring, continues to be conducted in support of ERDC's ongoing treatability study at Site 5.

With the exception of hexavalent chromium analyses, all samples collected by Advancia Corp. were analyzed by ACZ Laboratories, Inc. (California Certification Number, 1880). Hexavalent chromium was analyzed by Fruit Growers Laboratory, Inc. (California Certification Number, 1573). For each sampling round, the appropriate laboratory submitted quality control reports. All original documentation is maintained by USAEC. This documentation is summarized for each laboratory in Tables 13 and 14. The tables list, by round, any deviation from accepted values and the implication of the variance. All analyses for samples collected by Advancia Corp., as well as ERDC, were conducted using USEPA methods (SW846) (Table 12) or equivalent procedures. The deviations noted had no impact on the assessment of the technology.



**Table 13: ACZ Laboratories**

<b>Sampling Round</b>	<b>Variance</b>	<b>Implication</b>
<b>1</b>	MS/MSD for Chromium was slightly lower than expected.	Matrix interference. Recovery was just below the 80% limit, so the chromium results should be considered biased low.
	Poor recovery of silver.	Poor recovery for Silver quality control is accepted because Silver often precipitates with chlorides in the sample.
	Methylene Chloride was detected in the laboratory blank.	Methylene chloride is a common laboratory contaminant. Sample results will be biased high.
	2-Chlorophenol duplicate recovery was out of control.	Compound not found in any field sample.
<b>2</b>	Lead MS/MSD was under the control limits (78.8 & 76.6% versus 85% lower limit).	Matrix interference in the sample. Samples were re-analyzed utilizing the method of standard additions to reduce the effect of this interference.
<b>4</b>	Nickel MS/MSD was under the lower limit (78.7 and 79.6 versus 80%).	Samples were re-run with an analytical spike to reduce matrix interference.
<b>6</b>	Lead MS/MSD recoveries on 2 samples were below control limits. Recovery on the third sample was within limits.	Low recoveries were on surface water samples and may indicate matrix interference. Because of the very low recovery, results should be considered estimates only.
	Poor recovery of silver.	Poor recovery for silver quality control is accepted because silver often precipitates with chlorides in the sample.
<b>9</b>	BNA laboratory control sample had 3 compounds (4-chloro-3-methylphenol, 4-nitrophenol, nitrobenzene-d5) flagged for results above the control limit. All were close to 100%.	Results for these compounds should be considered biased high.
	Chromium MS recovery was high at 125.9% versus upper limit of 125%.	Results should be considered as biased high.

**Table 13: ACZ Laboratories (Continued)**

<b>Sampling Round</b>	<b>Variance</b>	<b>Implication</b>
<b>13</b>	Trace levels of acetone (3 lots) and bis-2-thylhexylphthalate (one lot) was found in prep blanks	Results should be considered as biased high for these compounds.
	Semi-volatile surrogate recoveries for PW5-6, SW5-2, PW5-1, PW5-2, PW5-12 and PW5-16 had at least one unacceptable surrogate recovery due to sample matrix interference.	Data for those samples should be considered estimates.
	Lead MS/MSD originally failed and had to be rerun by method of addition.	Lead results are considered estimates.
	MSD for nickel for one lot was slightly below control limit.	Data accepted as MS was within control limits and RPD between the two is small.

**Table 14: FGL Laboratories (Chromium VI Analysis)**

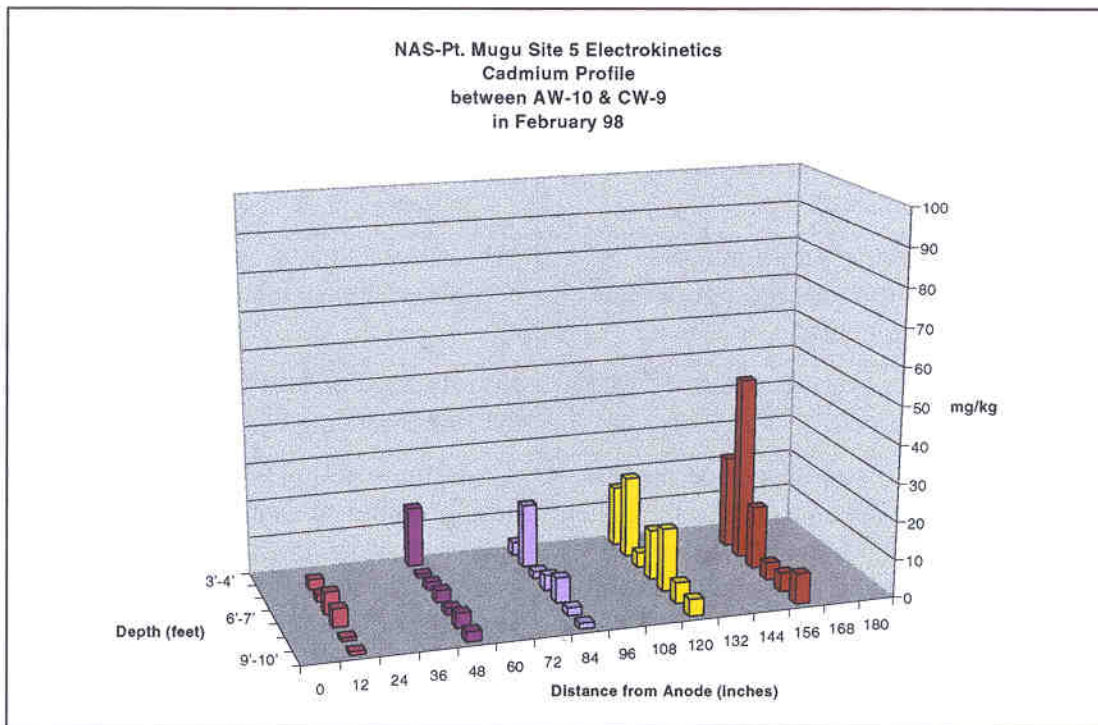
<b>Sampling Round</b>	<b>Variance</b>	<b>Implication</b>
<b>1-9</b>	MS not within Acceptance Range due to matrix interference on most QC batches. MS/MSD RPD was within limit on most sampling rounds. Batches were qualified based on the LCS recovery.	Data should be considered as estimated. No Chromium +6 was detected in rounds 1-9.
<b>10</b>	MS not within Acceptance Range due to matrix interference on most QC batches. MS/MSD RPD was within limit on most sampling rounds. Batches were qualified based on the LCS recovery.	For round 10, three samples (10 LP07C, 10 LP09C, and 10 PW5-06) were found to have chromium levels above the detection limit of 0.71, 2.7, and 0.02 mg/l, respectively. These should be considered as biased low estimates.
<b>13</b>	MS not within Acceptance Range due to matrix interference on most QC batches. MS/MSD RPD was within limit on most sampling rounds. Batches were qualified based on the LCS recovery.	For round 13, five samples had chromium +6 above the detection limit. These should be considered as biased low estimates.

## 5.2 Data Assessment

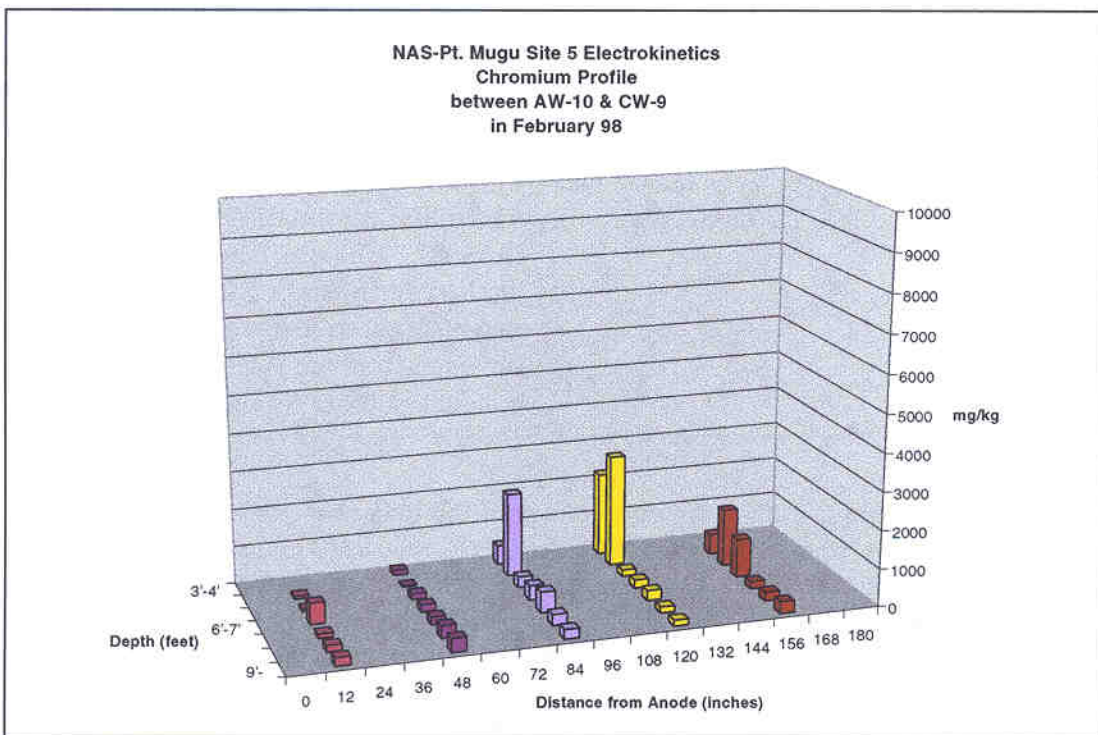
Operation and monitoring of test cell #1 was initiated in March 1998. The area was baseline characterized during the initial site characterization in 1997. Process control zones established by Lynntech were baseline characterized for cadmium and chromium in February 1998 prior to initiating system operation. The data gathered in the process control zone established between anode well AW-10 and cathode well CW-9 will be presented here since this area was monitored consistently throughout Lynntech's entire period of operation.

The baseline concentrations of cadmium and chromium in the process control zone are presented graphically in Figures 20 and 21, respectively. The concentrations are graphically represented with respect to distance from the anode well and with respect to depth. During the initial two months of the demonstration, Lynntech collected monthly soil samples from the process control zone. The intent was to monitor for changes in contaminant concentrations and pH changes in the soil with respect to time as the treatment progressed. At the end of the two-month period no significant changes in the contaminant concentrations or the pH within the treatment area had occurred. At this point Lynntech increased the current density applied to test cell #1 from 0.1 mA/cm<sup>2</sup> to 0.2 mA/cm<sup>2</sup>. This was the maximum increase that could be applied to the entire treatment area in test cell #1. The existing equipment limited further increases. Due to the apparent slow progress of treatment, the soil sampling in the process control zone was suspended until the development of a pH front could be detected in the pore fluid between the anode and cathode. The development of a pH front was considered a precursor to contaminant mobilization. Lynntech installed a series of ½" diameter piezometer wells in the process control zone in May 1998 to monitor pH front development. The baseline pH profile and the subsequent profiles taken throughout the 22 weeks of Lynntech's operation of the system are presented in Appendix G (Hodko et al, 1999). The pH data is presented in a RockWorks Inc. graphics program that interpolates between data points to allow the viewer to gain a visual representation of the profile. The program used an inverse distance gridding method to illustrate the data. With this method, the value assigned to a specific location on the map is a weighted average of a number of directionally distributed neighboring data points. By June 1998, the pH effects in the pore fluid were primarily concentrated within one foot of the anode well.

A three-month review of the systems performance was held in May 1998. The field data collected by Lynntech indicated that the performance expected, based on the laboratory testing conducted by both Lynntech and ERDC, was not being achieved. All of the data collected in the field and both the Lynntech and ERDC laboratory data and treatability-testing methods were reviewed. The bench scale testing conducted by Lynntech was supposedly designed to mimic the expected performance of the system installed in the field. The review of the bench test design and operation identified several discrepancies between the procedures used on the bench test and those used in the field. The differences between Lynntech's laboratory and field operations are summarized in Table 15. Limited by the current knowledge of electrochemical processes occurring as a result of the application of the electric field, the effect on system performance resulting from these deviations in the application of the technology in the laboratory and in the field could only be subjectively assessed. ERDC and Lynntech believed that the primary difference that would affect performance was the current density applied to the treatment area. Lynntech had applied 2.3 mA/cm<sup>2</sup> to the bench scale test cells and only 0.1 mA/cm<sup>2</sup> to the field treatment area.



**Figure 20: Baseline Cadmium Profile**



**Figure 21: Baseline Chromium Profile**

**Table 15: Deviations Between Lynntech Bench Scale Testing and Field Operations**

<b>Bench Scale Tests</b>	<b>Fielded System</b>
Electroosmotic flow was uncontrolled during bench scale operation. Significant flow was observed but not monitored.	The electrode wells were designed to minimize or eliminate electroosmotic flow.
pH control and citric acid addition to the cathode well was continuous throughout the bench scale operating period.	pH control and citric acid addition was performed approximately every two hours.
A soil pH of 3.0 was achieved within 10 to 20 days in the bench test cell.	No influence on soil pH was observed during the first 3 months of operation.
After approximately 6 months of operation a soil pH of 1.5 to 2.0 was observed in the bench test cell. Soil pH was not maintained above the 2.5 limit established for the field operation. The effects that the lower operating pH had on contaminant removal efficiency could not be determined.	A minimum soil pH of 2.5 was established to limit possible environmental effects that the operation of the electrokinetic remediation system may produce. This minimum soil pH was never exceeded during field operations.
No well packing was used around the electrode wells installed in the bench test cell.	A sand/clay mixture was used on the fielded system. Later observations by ERDC showed a significant voltage gradient developed across the packing material. It's possible this may ultimately impede contaminant transport.
Constant amperage was applied to the bench test cell, allowing the voltage to fluctuate. The current density applied was 2.3 mA/cm <sup>2</sup> .	A constant voltage was applied to the fielded system, allowing the amperage to fluctuate. The initial current density applied was 0.1 mA/cm <sup>2</sup> . This was based on current densities applied during prior Lynntech field demonstrations and was not related to data obtained from the Point Mugu laboratory trials conducted either by Lynntech or ERDC.

During ERDC's laboratory trials, a current density of 0.5 to 0.7 mA/cm<sup>2</sup> was used. The test cell design was not intended to simulate the fielded electrokinetic system design or to establish operating parameters for the field. The purpose of ERDC's treatability testing was to assess the technology's potential for mobilizing the contaminants at the site, to identify factors which may inhibit the technology's performance, and to subjectively estimate the technology's progress and performance in the field. Other than the current density applied to the ERDC bench tests, another notable difference between the ERDC bench tests and the field was the use of de-ionized water in lieu of the brackish water present at the site. The failure to use site water in the bench tests resulted in the failure to identify the process inhibiting effects caused by the ions in the water. These ions tended to retard the rate of establishment of the pH front and subsequent

contaminant ion mobilization. Also, as will be discussed later, these ions resulted in reactions at the electrodes that ultimately produced trihalomethane contaminants in the treatment area soils.

In an effort to increase the rate of contaminant movement, the power applied to test cell #1 was increased further. To achieve a power increase with the existing equipment, the treatment area within test cell #1 was reduced by approximately one half so that treatment was applied to only the east waste lagoon. The current density was increased from 0.2 mA/cm<sup>2</sup> to more than 0.33 mA/cm<sup>2</sup> in the reduced test area. The reduced electrokinetic extraction system was operated for an additional 10 weeks. The progress of the pH front development during this period can be seen in the process control zone pH profiles provided in Appendix G. As can be seen in the sequence of graphs, a pH front appeared to be migrating from the anode to the cathode primarily at the 7-foot depth. Also, during this period the chromium concentrations in the anode well appeared to increase by an order of magnitude (Table 16).

**Table 16: Electrode Well Chromium Concentrations**

		C H R O M I U M (ppm)						
Well #	04-Apr-98	13-Apr-98	27-Apr-98	25-May-98	11-Sep-98	18-Sep-98	25-Sep-98	06-Oct-98
AW9	8	3.7	8.98	12.1	18.8	19.1	23.6	25.3
AW10	3	2.3	5.76	10.2	27.9	29.5	47.5	25.1
AW11	1.2	1.3	5.41	5.73	7.48	10.2	5.06	14.3
AW12	1.4	1.6	6.28	9.24	20.3	47.3	60.6	49.5
AW13	4.3	3.6	5.92	8.84	23.6	41.8	25.2	20.6
AW14	0.9	0.8	0.92	3.95	9.7	12.2	10.4	7.19
AW15	0.9	1.4	1.28	3.15	5.34	6.94	4.02	4.59
AW16	0.3	0.2	0.38	0.61	8.91	8.54	6.76	4.62
AW17	1.3	1.3	2.53	2.3	9.83	13.9	NS	10.2
AW18	0.7	1	4.15	2.72	8.84	5.22	NS	3.56
AW19	1.2	1.8	9.82	17.1	41.7	46.8	NS	32.3
AW20	1.8	1.4	2.79	4.12	22.6	29.2	NS	20.8
AW21	1.4	1.3	2.01	3.12	14.4	13.2	NS	6.14
AW22	1.1	0.8	0.89	3.34	14.6	15.2	NS	9.01
AW23	0.5	0.5	0.71	3.01	13.1	13.5	NS	6.3
AW24	0.8	0.9	2.5	3.95	9.34	7.53	NS	5.68
CW8	4.3	1.8	5.09	3.52	0.53	<0.14	0.54	NS
CW9	1.9	1	3.08	1.88	0.42	<0.14	0.4	NS
CW10	1.6	1	2.07	0.44	0.28	<0.14	0.43	NS
CW11	1.5	0.8	1.29	1	0.19	<0.14	0.2	NS
CW12	1.5	0.7	0.97	0.91	0.17	<0.14	2.07	NS
CW13	1.7	1.1	1.24	0.82	0.22	0.3	0.46	NS
CW14	1.6	0.7	0.97	0.68	0.75	0.68	0.49	NS

AW Avg	1.80	1.49	3.77	5.84	16.03	20.01	22.89	15.32
CW Avg	2.01	1.01	2.10	1.32	0.37	0.49	0.66	NA
Field Avg	1.87	1.35	3.26	4.47	11.26	17.84	12.52	15.32

NS - No sample was collected.

NA - Not applicable.

In total, the system operated for 22 weeks. In October 1998, another progress review was conducted. In spite of the development of the pH front and the increasing concentrations of contaminants in the electrode wells, performance of the technology was not meeting USAEC and ESTCP expectations. USAEC determined that unknown factors (either system design or site soil

characteristics, or both) were retarding the performance and that the technology required further investigation and development prior to full-scale implementation. This assessment was further supported by the process control zone soil concentrations sampled in October 1998 (Figures 22 and 23). The data, when compared to the baseline concentrations (Figures 20 and 21), do not indicate any significant trend of contaminant migration towards the electrodes. On 7 October 1998, the field demonstration at Site 5 was suspended. ERDC, with NAWS Point Mugu support, is continuing the investigation and development of the technology for its potential use at Site 5. Result from the continued operations conducted by ERDC will be presented in future ERDC reports.

### **5.2.1 Demonstration Objectives Assessment**

Performance objectives for the demonstration of electrokinetic remediation were identified in Chapter 4. Following is an assessment of each of the evaluation issues supported by the available data.

#### **5.2.1.1 Treatability Study Validation**

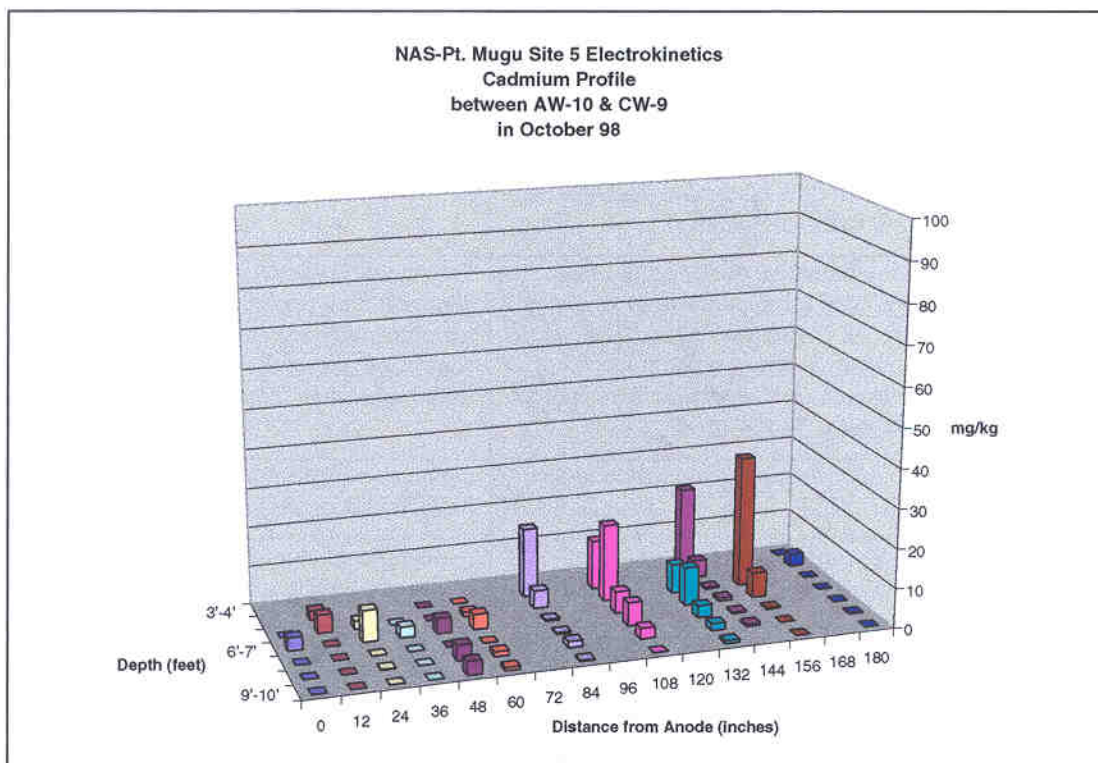
The ERDC laboratory treatability studies conducted to support this demonstration were meant to provide indications of the affinity for contaminant mobility and removal efficiency. They were meant to provide a general scenario of how the technology was expected to perform in the field. Based on the study results, pH front development between the electrodes was expected to be measurable within the first 3 months of operation and significant contaminant removal was expected by the end of the 9-month field demonstration period. A summary of the ERDC bench test results and corresponding field test results are provided in Table 17. The bench tests did not accurately reflect the effects that site conditions would have on the technology, specifically the retarding effects that competing ions would have on pH front development and contaminant mobility. Contaminant mobility and pH effects were ultimately observed in the field, however, the duration required for treatment in the field will be much longer than anticipated by the bench tests. Also, the bench tests did not reflect the by-product formation that was encountered in the field, specifically the hydrogen sulfide gas formation. As currently designed, the bench tests do not provide an adequate means of predicting performance, duration, and efficiency or the formation of potentially hazardous by-products as a result of the technology's reaction with site-specific constituents. At best it provided an indication that contaminants would ultimately mobilized when the technology is applied.

#### **5.2.1.2 Performance Assessment**

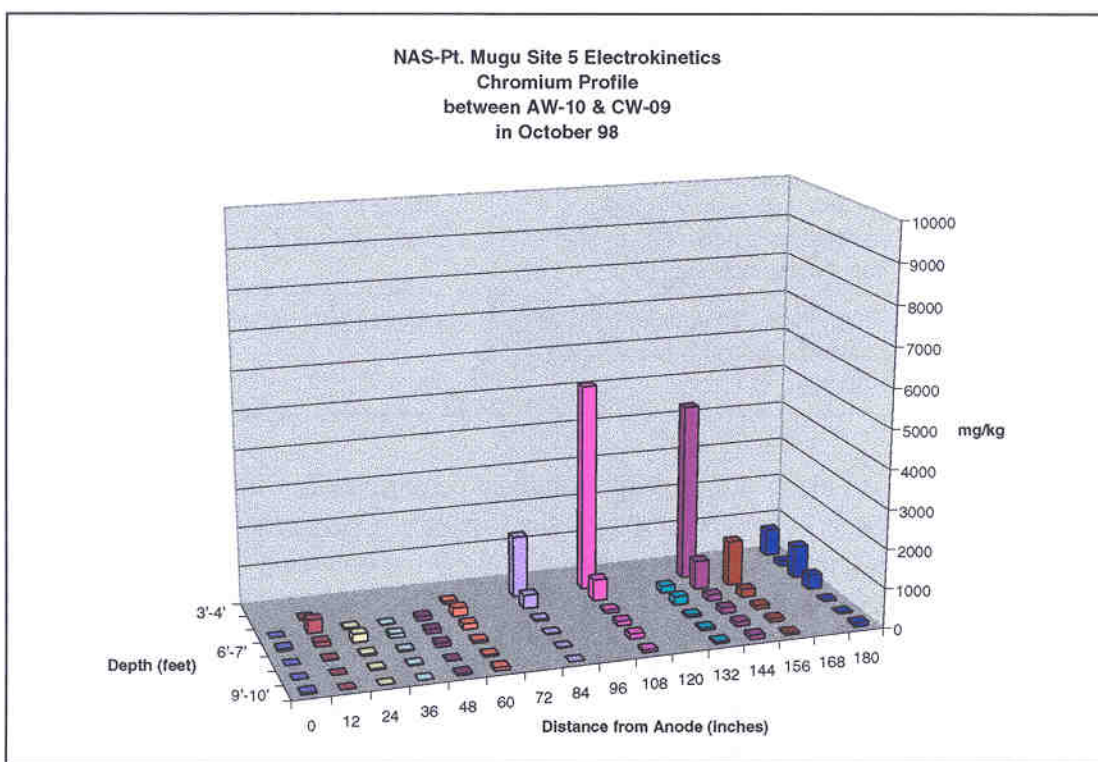
The performance of electrokinetic remediation is assessed based on its ability to reduce contaminant levels to meet regulatory requirements. Also, the technology's ability to be used without adversely affecting the environment was assessed. The technology performance assessment is as follows:

**5.2.1.2.1** The performance goal for the technology was to reduce contaminant levels to California state TTLC and STLC levels as well as to established Modified Region 9 PRGs. No contaminants were extracted during the demonstration period. Post treatment soil samples were not taken because of the poor performance. The contaminant reduction goals for the technology were not met. The contaminant reduction efficiency should be re-evaluated upon completion of ERDC's follow on fieldwork.





**Figure 22: Cadmium Profile (October 1998)**



**Figure 23: Chromium Profile (October 1998)**



**Table 17: Summary of Validation Components**

<b>Validation Component</b>	<b>ERDC Study Results</b>	<b>Field Study Results</b>
Removal Efficiency	Average removal efficiency after 1390 hours operation of citric acid amended test cell: 25% Chromium removal and 28% Cadmium removal.	No significant contaminant removal was achieved during the field demonstration.
Power Requirements	The cumulative power requirement measured for the nitric acid amended test cell is 15.5 kW-hr/m <sup>3</sup> . The cumulative power requirement measured for the citric acid amended test cell is 34 Kw-hr/m <sup>3</sup> .	Treatment was not completed during the demonstration period. Cumulative power requirements were not established. Due to competing ions at the site power requirements were higher than those observed in bench tests.
Electroosmotic Flow	5.9 ml/hr measured in citric acid test cell.	Lynntech well design inhibited electroosmotic flow. Effect on performance is assumed minimal.
Media Effects	<ul style="list-style-type: none"> <li>– Significant chlorine gas production. 1.25 x 10<sup>-4</sup> to 6.25 x 10<sup>-4</sup> lb. Cl<sub>2</sub>/ton of soil/hr measured in oxalic acid amended test cells. (Gas production may differ with citric acid amendment use.)</li> <li>– Increased conductivity and reduced power usage due to brackish water and saturated site conditions.</li> <li>– Soil permeability at the site is not expected to adversely affect the contaminant removing ability of the technology.</li> </ul>	<ul style="list-style-type: none"> <li>– Significant chlorine gas production. Chlorine gas production was not quantified.</li> <li>– Free chlorine produced in the anode wells stimulated the production of trihalomethanes in the shallow soils.</li> <li>– Significant hydrogen sulfide gas produced in the cathode wells.</li> <li>– Increased conductivity and increased power usage due to competing ions in brackish water.</li> <li>– Soil permeability at the site did not adversely affect the contaminant mobility.</li> </ul>
Basic Process Operating Parameters	<ul style="list-style-type: none"> <li>– Minimum pH 2.8 for citric acid amended test cell. No increase in the pH or movement of the contaminants outside of the treatment area is expected.</li> <li>– Chlorine gas from anode well off-gases will be removed via stripping.</li> </ul>	<ul style="list-style-type: none"> <li>– No increase in the pH outside of the barrier wall was detected. Ability to control pH effects in uncontrolled treatment area was not assessed.</li> <li>– Off-gases from anode and cathode wells were required to be treated prior to release.</li> </ul>

**5.2.1.2.2** Control of the electrokinetically mobilized contaminants within the confined and unconfined treatment areas cannot be assessed due to the poor performance of the technology during the demonstration period. The process control zone monitoring indicates that metal contaminants were beginning to be mobilized during the later stages of the system's operation. Piezometer well monitoring did not detect any pH effect or mobilized metal contaminants from the artificially confined treatment area (test cell #1) during this period (See Appendices D and E for supporting data). Although mobilized metals were not detected, an accurate assessment of contaminant mobility control cannot be made until significant treatment has occurred. No data was collected to assess the technology's ability to control contaminant movement in the uncontrolled treatment area (test cell #2) because this test cell was never activated.

**5.2.1.2.3** Gas emissions produced at the anode and cathode wells were chlorine, oxygen, hydrogen, and hydrogen sulfide. The gases were evacuated from the headspace of the wells and passed through a scrubber prior to release to the atmosphere. Monitoring of the scrubber discharge showed no indication of chlorine or hydrogen sulfide release. Although the scrubber was effective in removing the hazardous gas emissions extracted from the electrode wells, the system initially installed to evacuate the electrode wellhead space was ineffective. As a result, gases were allowed to buildup in the headspace of some of the wells until a more aggressive headspace evacuation system was installed. The hydrogen sulfide gas in the cathode wells was effectively removed and treated with the system upgrade, however, the chlorine gas production in the anode well required the addition of a sparging system to strip the chlorine from the anode electrode. The chlorine buildup in the anode well and pore fluid did not present a personnel hazard since the wells were sealed.

**5.2.1.2.4** Based on the initial site characterization the metals contaminants are the primary contaminants at Site 5. Only trace amounts of organic contaminants were detected during the site characterization. To ensure that the technology had no impact on these trace contaminants, quarterly groundwater monitoring and Goresorbers were used to detect any affect the technology might produce.

Throughout the operation of the electrokinetic system, the electrokinetic process effects on the existing organic contaminants were believed to be inconsequential and only quarterly monitoring was conducted to track process effects on VOCs. Routine sampling began showing indications of trihalomethane accumulation in a piezometer well inside the defined treatment area. Subsequent sampling revealed that trihalomethanes (with chloroform being the primary trihalomethane constituent) were also accumulating in the shallow breakout wells outside of the barrier wall at the site. The chloroform contaminant initially appeared in piezometer well P-8 at a concentration of 720 parts per million (ppm) in the September 1998 event. Initially, the chloroform, which was not detected during the baseline sampling, was thought to be some type of water treatment disinfectant by-product that may have been dumped in the area, although there is no record of such practice occurring. During Advancia's last sampling round (round 13) in February 1999, chloroform and other trihalomethane contaminants were found in increasing concentrations in wells P-4, P-6, and P-16. At this point, the possibility that the electrokinetic system maybe the source of the contaminant was considered. Data for all of the VOC sampling results are provided in Appendix C.

As part of the Advancia sampling program, supplemental monitoring to determine the effects the electrokinetic process had on organic contaminants in the vapor phase was conducted using GoreSorber® modules. In March and July 1998, GoreSorber® modules were placed in and around the electrode wells for organic compound detection. The original belief was that any affect the process my have on organic contaminants at the site would be volatilization as a result of soil heating. Analytical data from the GoreSorber® modules are presented in Figure 24. The GoreSorber also detected an increase in chloroform concentration as the electrokinetic system was operated.

The formation of trihalomethanes is believed to be a result of the production of chlorine at the anode wells due to the electrolysis (oxidation) of the seawater. Production of the chloroform and other trihalomethanes at the anode wells maybe described by the following process. Equations 9 and 10 show the first steps in the disinfecting process, the generation of a hypochlorous or hypobromous acid. If the pH is above 1.0, the equilibrium is shifted greatly to the right with

very little free  $\text{Cl}_2$  or bromine ( $\text{Br}_2$ ) in solution. Below pH 1.0, the equilibrium will shift to the left.

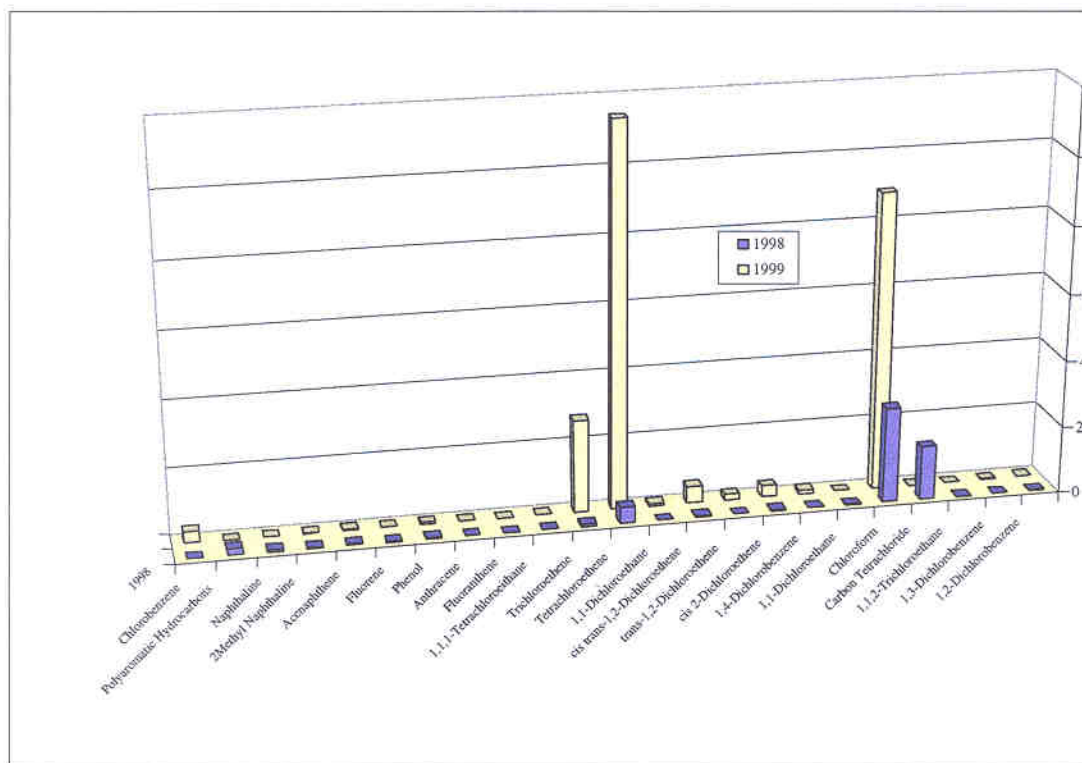
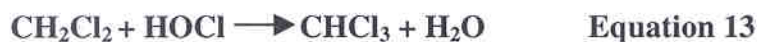
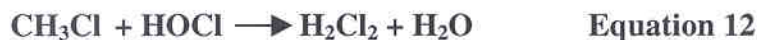


Figure 24: GoreSorber® Module Results, July 1998 and February 1999 Rounds



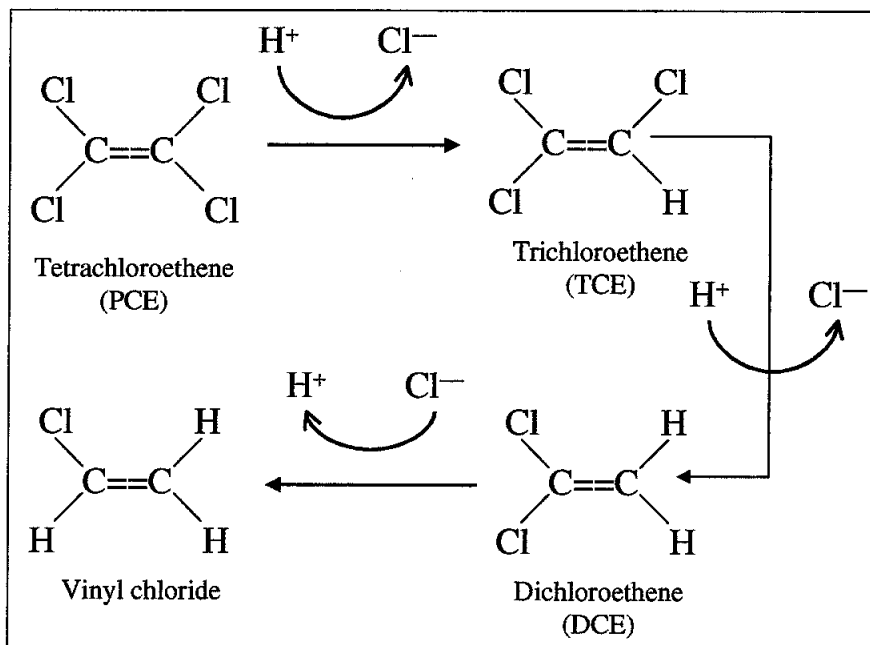
The second step in the process is shown in Equations 11 through 13. The hypochlorous (or hypobromous) acid reacts with a methane molecule producing chloromethane. That molecule can then react with another hypochlorous acid molecule giving dichloromethane (methylene chloride), followed by the third step to give chloroform. Chloroform is found in higher concentrations and more frequently than any other of the trihalogenated methanes at the site.



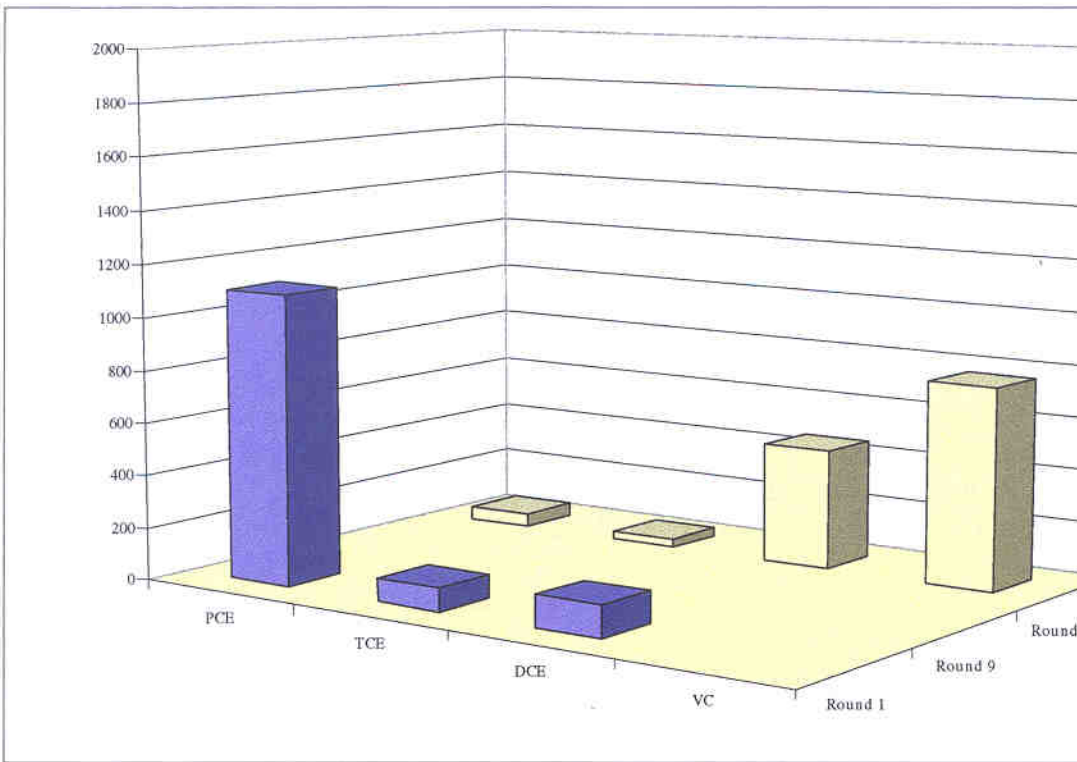
The increase in concentration of the trihalomethane as a result of the electrokinetic process indicates that active halogenation was occurring in part of the process area. Given that the marsh area would be an active site for biological degradation of organic matter to methane and with the

presence of chlorides and bromides in seawater, the possibility of the creation of hypochlorites and hypobromites that would then halogenate the methane and produce the trihalomethanes seems likely.

The VOC data also indicated that there was an increase in the vinyl chloride concentrations in some of the wells. While not commonly seen in aerobic conditions, the reductive dehalogenation of tetrachloroethene (i.e., perchloroethene, PCE) is found to occur naturally under anaerobic conditions. The dehalogenation occurs as a reduced chlorinated compound loses an electron and becomes oxidized (Figure 25). The shared electrons of the carbon-chlorine bond are transferred to the halogen, cleaving it from the compound. The electron-deficient carbon then attracts a proton ( $H^+$ ) to the former chlorine position. While PCE and TCE were commonly used solvents that would be expected to be found in the lagoons due to past dumping practices, vinyl chloride would not have been used as a solvent due to its high vapor pressure and reactivity. Therefore, the increase in the vinyl chloride concentration that is seen (Figure 26) is indicative of a dehalogenation process occurring at an accelerated rate during the time the electrokinetic remediation system was operating. In time, the anaerobic conditions are expected to result in the complete dehalogenation of the chlorinated compounds including the vinyl chloride.



**Figure 25: Reductive Dehalogenation of PCE to Vinyl Chloride**



**Figure 26: PCE-to-Vinyl Chloride Reduction – Piezometer P-16**

**5.2.1.2.5** The biota impacts resulting from the use of the electrokinetic process are discussed in detail in the report provided in Appendix F, *Assessment of the Biological Impacts of the Electrokinetics Demonstration Project at the Naval Air Station Pt. Mugu* (Ambrose et al, 1999). The majority of the impacts observed at the site can be attributed to the site construction activities. The construction to install the demonstration equipment affected the site by altering the sediment characteristics and trampling (killing) the vegetation in the treatment area. These effects were noticed during the Before sampling. The invertebrates living in the salt marsh sediments were consistently less abundant than those in a nearby Control site, suggesting an impact of construction on the salt marsh infauna. During the demonstration project, there was little disturbance of the tidal creek substrate where infauna samples were taken, and no effects on the infauna there were observed (Ambrose et al, 1999).

After the demonstration, two changes apparently caused by the demonstration were observed. There was a 98% decrease in benthic invertebrates in the unvegetated edge of the creek. In contrast, infauna at the Control site increased during the study period. The Impact site also had decreased fish and crab catches, whereas the nearby Control site did not. The reduction in fish and crab in the Impact site most likely is a consequence of the lack of food in the tidal creek. In spite of the impacts to the vegetation caused by the installation of the demonstration equipment, no impacts to the salt marsh infauna were observed. Frogs around the waste pits at the Impact site also did not appear to be affected by the demonstration (Ambrose et al, 1999).

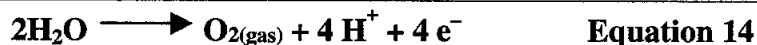
The salt marsh vegetation did not recover from the construction impacts during the demonstration project. Recovery may have been inhibited by the fact that the entire demonstration project was tented, thereby reducing the light received by the salt marsh plants.



Although it is not possible to predict how fast recovery would have been in full sunlight, it is reasonable to assume a faster recovery rate (Ambrose et al, 1999).

**5.2.1.2.6** The potential to recycle the metal contaminants extracted during the electrokinetic remediation demonstration could not be assessed because no contaminants were successfully extracted.

**5.2.1.2.7** The site characteristic that affected the treatment performance was the high chloride concentration of the groundwater. In order to produce a pH front of  $H^+$  ions, the electrolysis of water must occur at the anode (Equation 14).

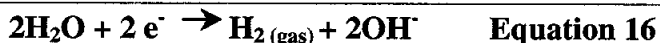


If the reaction site is occupied by a chloride ion undergoing reaction (Equation 15) additional current will be needed when the reaction site on the electrode becomes vacant.



Therefore, the higher the chloride content of the solution, the greater the current needed to obtain the same number of  $H^+$  ions in solution. The chloride reactions at the anode act to retard the development of the pH front that in turn lengthens the time required to extract the contaminants from the soil.

A second effect was noted at the cathode where water is being hydrolyzed to release hydroxide ions (Equation 16).



Additional current used because the chloride reaction at the anode will result in additional hydroxide ions being produced at the cathode. This excess hydroxide ion production will need to be neutralized by the use of additional acid at the cathode, thus increasing the operating cost of the unit.

### **5.2.1.3 Safety Assessment**

Site characteristics that may affect the safe operation of the technology system are generally related to what is termed "slip, trip, and fall" hazards. Numerous electrical cables and plumbing pipe are needed to operate the system. No electrical hazard is directly associated with the electrokinetic system since the power grid is grounded and the electrodes are sealed inside the electrode wells.

Potential health hazards to site workers and the immediate public around the site were the generation of process fugitive emissions (e.g., chlorine and hydrogen sulfide gases). When hydrogen sulfide gas was identified, Advancia's and Lynntech's site health and safety plans were updated to protect the site workers and local public. Specific procedures were implemented to ensure that site workers and the local public would not be affected by the system emissions. No health hazard was associated with the generation of hydrogen gas and oxygen.

### **5.2.1.4 Regulatory Acceptance**

Regulatory acceptance for use of the electrokinetic remediation has not been obtained because of the poor performance of the technology during the field demonstration. The follow on fieldwork

being conducted by ERDC will strive to gain acceptance of the technology as a remedial option specifically for Site 5 at NAWS Point Mugu.

### **5.3 Technology Comparison**

Technologies with which electrokinetic remediation must compete are "Dig and Haul", Soil Washing, and Phytoremediation.

"Dig and haul" involves the physical removal of the contaminants and the soil through excavation followed by treatment to solidify and stabilize the contaminants prior to disposal in a licensed landfill. Contaminant removal in the saturated zone is difficult and the impact of this on the environment is a consideration.

Soil washing is an ex-situ remediation technique used to clean up excavated contaminated soils. Soil washing uses physical separation and chemical washing to liberate contaminants from the surfaces of soil particles. It serves to reduce the volume of material requiring disposal.

Phytoremediation, the use of plants, grasses and trees to remove, degrade or sequester hazardous contaminants from the environment, is a rapidly growing sector of the remediation industry. This technology is potentially applicable to a variety of contaminants, including heavy metals, radionuclides, inorganic compounds, and organic compounds, and can be used on soils, ground water, and wastewater. Field validation of this technology is needed prior to competitive use as a cleanup technology for metals contaminated sites.

Based on the results of the field demonstration at NAWS Point Mugu, excavation followed by solidification/stabilization or soil washing has proven to be more effective. Future development of electrokinetics may improve its ability to competitively cleanup metals contaminated sites.

## **6.0 Cost Assessment**

This section identifies the technology specific capital and operation and maintenance (O&M) costs associated with the full-scale use of electrokinetic remediation for metals contaminated soil. The identification of these costs for this technology is complicated by three factors. First, this was a demonstration-scale project. In order to identify the full-scale costs, extrapolation of the costs incurred on the demonstration scale project will be necessary. Any assumptions used in extrapolating these costs will be documented. Secondly, effective treatment was not achieved during the demonstration. This was due to site-specific characteristics that retarded the performance of the technology and potential technology design/application issues that may have reduced the technology's effectiveness. Thirdly, a detailed cost breakdown of the technology application's specific elements is not available. Although the documentation of a detailed breakdown of costs had been required by the demonstration plan, Lynntech did not maintain records to document the desired level of cost categories. This was not discovered until after the fact. As a result, the costs reported here are aggregate level capital and O&M costs. Although an accurate treatment cost associated with electrokinetic remediation cannot be derived from the available information, the costs presented here will shed some light on the true potential cost range for use of the technology. Electrokinetic vendor literature typically quote costs only in terms of power and chemical amendments used. The capital costs and other O&M costs have not been available in the past.

### **6.1 Cost Performance**

The costs associated with use of electrokinetic remediation are summarized in Table 18. Following are discussions of the cost categories and elements listed in Table 18, the assumptions made, and identification of costs that may vary from site to site.

#### **6.1.1 Capital Cost**

The capital costs incurred in the demonstration are approximately equivalent to full-scale costs. The entire source area of contaminants at Site 5 fell within the demonstration treatment area. As a result, no assumptions for scale up were made in the capital cost with the exception of demobilization costs as described below.

The cost incurred for technology mobilization and setup totaled \$218,081. This consisted of \$88,025 in material and \$130,056 in labor. Demobilization costs were not incurred since the electrokinetic system is still deployed at the demonstration site for continued study and operation by ERDC. A rough estimate for demobilization is approximately \$60,000, which would include process piping and electrical equipment removal and extraction of the well casings, if necessary.

Planning and preparation consisted of discussions with regulatory officials and providing information on the technology design, method of operation, expected performance, by-product formation, etc. in order to gain approval to conduct the field demonstration. No permits were required to conduct the demonstration. The cost incurred for planning was \$19,774.

Site work involved routing utilities to the site (i.e. electricity, telephones, and water). The total cost incurred was \$10,908. This cost will vary with utility availability at the site.



Process equipment procurement and construction included assembly of the control equipment, power distribution equipment, well assemblies and electrodes, chemical addition system, etc. The aggregate material cost was \$157,454. Labor to design and assemble the equipment was \$312,565.

Startup and testing consisted of approximately a month of labor for three people to run through a sequence of system tests, trouble shoot problems, and initiate the field operations. Labor costs associated with this step were approximately \$50,000.

Other capital cost included pre-deployment treatability testing which consisted of bench scale testing and a preliminary field test to determine electrode spacing. Material costs of \$4,486 and labor costs of \$57,720 were incurred.

### **6.1.2 O&M Costs**

The O&M costs incurred in the demonstration are only a fraction of what is actually needed to effectively clean up a site if the only factor in electrokinetic remediation ultimately being effective is a longer duration of operation. The cost provided will only reflect the cost incurred during the March through October period of operation. Unit O&M costs should be addressed if a longer period of operation is required. Since only a portion of the test cell was operated during the entire period of operation, the material and utility costs associated with the half of the test cell that was continuously operated will be multiplied by two to estimate costs for the entire test cell.

Labor required to operate the system during the March through October 1998 operation period was \$206,390. The high labor cost was primarily due to the need to have someone in the field almost constantly to repair and monitor the equipment. This cost could be substantially reduced with improved system design and equipment selection. Some of the equipment utilized could not withstand the long exposure to the outdoor environment or the chemical by-products formed in the electrode wells.

The primary consumable material utilized by the process was citric acid. During this period of operation 3,737 pounds of citric acid was used in the portion of test cell #1 that was operated for the entire period. Since only half of the test cell was operated, the assumption is that twice as much citric acid, or 7,474 pounds would have been used at a cost of \$.80 per pound in the entire test cell during this period.

The utilities required consisted of electricity and telephone service. Negligible amounts of water were used during the demonstration. The operating portion of test cell #1 utilized a total of 15,465 Kwh of electricity. Assuming that the twice as much electricity would have been used to operate the entire test cell then a total of 30,930 Kwh would have been used during the operating period at a cost of \$.085 per Kwh. The telephone service cost was approximately \$200 per month.

Miscellaneous storage and equipment rental during the operation was approximately \$1000.

Performance testing and analysis costs (\$84,264) were high during the period of operation due to the frequent sampling required by Lynntech to identify the factors that were retarding the performance of the system. Whether or not this level of testing is required for full-scale application cannot be determined so the testing costs are included in the unit cost calculations in Table 18.

### **6.1.3 Other Technology-Specific Costs**

No other costs were incurred during the demonstration. The types of cost listed under this category would have been incurred if contaminants had been extracted from the site by the electrokinetic process. However, since no contaminants were extracted, there is no basis for estimating these costs.

### **6.1.4 Quantity Treated/Unit Cost**

The size of the treatment area within test cell #1 was 45 feet X 60 feet X 10 feet deep. Based on these dimensions approximately 27,000 cubic feet (or 1,000 cubic yards) of soil were being treated by electrokinetic remediation within test cell #1. The unit cost for approximately 22 weeks of treatment with the electrokinetic technology was \$1,193.

## **6.2 Cost Comparison**

Other currently available technologies are two to four times less expensive than the unit costs for electrokinetic remediation as derived from the costs incurred during the electrokinetic demonstration at NAWS Point Mugu. System design and operating improvements being developed by ERDC may, in time, substantially reduce the unit cost of electrokinetic remediation.

**Table 18: Electrokinetic Remediation Unit Costs**

Cost Category/Element		Cost (\$)	Cost for Calculating Unit Cost
<b>Capital Cost for Technology</b>			
Technology mobilization, setup, and demobilization		278,081	
Planning and preparation (regulatory permitting)		19,774	
Site work (utility installation)		10,908	
Equipment and appurtenances (Process equipment and appurtenance/construction)		470,019	
Startup and testing		50,000	
Other (Pre-deployment treatability testing)		62,206	
<b>Total Capital Costs</b>			<b>890,988</b>
<b>O&amp;M for Technology</b>			
Labor		206,390	
Materials		5,979	
Utilities and fuel		4,429	
Equipment ownership, rental, or lease		1000	
Performance testing and analysis		84,264	
Other			
<b>Total O&amp;M Costs</b>			<b>302,062</b>
<b>Other Technology-Specific Costs</b>			
Compliance testing and analysis		0	
Soil, sludge, and debris excavation, collection, and control		0	
Disposal of residues		0	
<b>Total cost</b>			
<b>Total cost for calculating unit cost</b>			<b>1,193,050</b>
<b>Quantity treated (cubic yards)</b>			<b>1,000</b>
<b>Calculated unit cost (\$/cubic yard)</b>			<b>1,193</b>

## **7.0 Regulatory Issues**

To support the sampling requirements and the demonstration that was to follow, Advancia, with support from USAEC, Point Mugu, and ERDC began the planning and coordination necessary to obtain approval from the agencies that were involved. This effort was focused on the California EPA - specifically the Department of Toxic Substances Control (DTSC) located in Long Beach, which monitored activities at Point Mugu. A number of briefings were conducted and meetings held to explain the demonstration program as it evolved.

By keeping the regulatory community firmly in the loop, we were able to structure the data collection effort to incorporate data items that DTSC deemed necessary to meet regulatory controls needs. In addition, changes in the plan or in field operations were facilitated because the regulators were "up to speed" and, therefore, familiar with the program goals and established physical/technical controls. Other regulatory agencies involved in the design and demonstration stages of the project included the California Regional Water Quality Control Board (RWQCB) and the California Department of Fish and Game.

Some of the regulatory issues discussed were:

- a) Applicable regulatory prerequisites related to the Technical Standards for tanks and secondary contaminant design for hazardous waste treatment systems are addressed in Title 22 California Code of Regulations Chapter 14 Section 66264.190-66265.200. A review of the regulations showed that secondary containment would be required for all tanks that store recycled ground water or hazardous substances.
- b) Attention to potential health hazards to site workers and the immediate public around the site were the generation of process fugitive emissions (e.g., chlorine and hydrogen sulfide gases). Specific procedures were implemented to ensure that site workers and the local public would not be affected by the system emissions.
- c) What controls would be established to ensure that the adjacent wetlands were protected? The Point Mugu area contains an extensive tidal marsh area and is one of the largest remaining coastal wetlands in the United States. The Site 5 area is immediately adjacent to part of this coastal wetland. Impact on this area during field operations will be minimized through use of shortest paths to monitoring areas and keeping personnel and equipment intrusion to a minimum.

## **8.0 Technology Implementation**

### **8.1 DoD Need**

There is an estimated 8,336 DoD sites requiring remediation. Based on the sites for which there is data available 67% of these sites have a contaminated soil matrix. Assuming the sites for which data is available is representative of all known DoD sites, then approximately 5585 DoD sites have a contaminated soil matrix. Metals contaminants occur in the soil at 69% of all sites with data. If this holds true for all known DoD sites with contaminated soil then approximately 3852 sites have metals contaminants in soils (USEPA, 1997).

The types of metals contaminated sites at which electrokinetics is likely to be applicable are spill areas, surface disposal areas, disposal pit/dry wells, storage areas, fire/crash training areas, and surface impoundment/lagoons. These types of sites comprise approximately 39% of the DoD sites. Assuming that the electrokinetics technology is applicable to only these types of sites then 1502 metals contaminated sites could be treated with electrokinetics. As currently designed and implemented, electrokinetic remediation does not offer a viable economic option for these sites.

### **8.2 Transition**

The next step for electrokinetics will be more detailed laboratory and field studies to address the problems encountered at NAWS Point Mugu. These problems include the following:

- a) Effects of competing ions on acid front development and contaminant movement.
- b) Electrochemical reactions with contaminants and naturally occurring organic species.
- c) The cost of using the technology.

ERDC continues to study the electrokinetic process in the laboratory and is attempting to continue operation of the field demonstration at NAWS Point Mugu to address these issues.

## 9.0 Lessons Learned

The purpose of this section is to discuss observations and critiques of the technology and the process. It is intended to provide an initial lessons learned discussion that will benefit future projects of this nature by pointing out where mistakes were made and what could have been done better when viewing the project in retrospect.

While the comments below may be considered to be overly critical of various elements, it is important to focus on the problems and not the successes. Also, the team assembled to execute this demonstration project was and is dedicated, professional, and technically qualified. Because the project was unsuccessful, there were obviously errors made in the attempt to apply the technology. This discussion will focus on the errors observed and questions concerning the technology application in the Point Mugu setting that remain unanswered. This summary does not assign or fix blame – that is presumptuous and counter productive – but discusses the problems observed.

**Background.** In 1996, Advancia Corporation was contracted to support the USAEC in a project to evaluate the readiness of electrokinetic technology as a cost-effective remediation process. The support consisted of two contractual efforts. The first involved the characterization of the site to be used for the demonstration project. The second involved the installation and operation of an electrokinetic system, to be used as a basis for the evaluation of the technology.

The site chosen for the demonstration were lagoons used to dispose of plating fluids, solvents, and other material. The site is located at NAWS, Point Mugu, California. The pits are adjacent to Mugu Lagoon – a natural wetland and habitat of the Light Footed Clapper Rail (an endangered species). The site was known to contain high levels of cadmium and chromium, even following an emergency removal action that was conducted in 1994.

The field sampling, conducted during the period 30 January to 18 February 1997, was designed to identify the areas where significant contamination remained. The sampling was also designed to establish two test cells. The first cell in the area of the pits was to be enclosed and used to demonstrate that the process could be controlled by means of the electromagnetic field. The second cell was to be placed in the marsh outside of the pit area. This cell was not enclosed but open to the environment. It was to be operated only after the fact that the process was controlled and working as expected in test cell #1.

To support the sampling requirements and the demonstration that was to follow Advancia, with support from USAEC, NAWS Point Mugu, and ERDC began the planning and coordination necessary to obtain approval from the agencies that were involved. This effort was focused on the California EPA - specifically the DTSC located in Long Beach, which monitored activities at NAWS Point Mugu. A number of briefings were conducted and meetings held to explain the demonstration program and the characterization plan as they evolved. By keeping the regulatory community firmly in the loop, we were able to structure our data collection effort to incorporate data items that they deemed as necessary to meet the needs for regulatory controls. In addition, changes in the plan or in field operations were facilitated because the regulators were thoroughly briefed and, therefore, familiar with the program goals and established physical and technical controls.



The site characterization established the presence of significant levels of both cadmium and chromium contamination. The heaviest contamination was limited to the upper levels, generally, the section three feet below the surface. Lower levels of contaminants (below California action levels) were found to exist at depths down to 12 feet. Following the characterization, the shape and position of the test cells was determined. The resulting configuration was used as the basis for the installation of a non-conductive barrier wall designed to isolate the area designated as Test Cell #1. The barrier wall consisted of inter-locking 80-mil thick, HDPE panels that were driven using a vibrating hammer to a depth of 20 feet. The technique used on the site was the first time this approach was used to install a subsurface barrier of this type. The approach was necessary because digging on the site was restricted due to the adjacent wetland.

Advancia conducted a nationwide search for potential electrokinetic vendors. Using various means (e.g., Commerce Business Daily advertisement, USEPA's Vendor Information System for Innovative Treatment Technologies, and the internet), a number of companies who claimed expertise were identified and asked to respond to a screening questionnaire. From the responses, five companies were invited to submit written proposals and participate in an oral screening process. Three companies responded, and Lynntech from College Station, Texas was selected as the technology vendor.

**NOTE:** Lynntech was considered by the selection committee to be one of two candidates fully capable of successfully performing an effective demonstration. The fact that the demonstration failed in its ability to remove the target material does not indicate that any other company could have designed or executed a more effective process and demonstration.

During the technology demonstration, the roles assigned to Advancia and Lynntech were divided on the basis of site management and system operation. As the prime contractor, Advancia was responsible for the overall operation of the site to include the planning and coordination necessary with the various agencies and activities involved. Lynntech was solely responsible for the operation of the electrokinetic cell.

Sampling conducted by Advancia was targeted at providing the necessary assurance that the process was in fact being controlled and the contaminants were not migrating outside the electromagnetic field or beneath or beyond the barrier wall. Advancia also analyzed approximately 10% of the Lynntech process control samples for Quality Assurance purposes. Lynntech sampling was restricted to that which was necessary to support effective and efficient process operation. Sampling frequency, parameters selected, and analyses run were based on Lynntech's requirements to operate the system.

Pre-deployment activities consisted of the planning and coordination necessary to install the system before the arrival of the Clapper Rail (nesting season). For Lynntech's part, it involved an extensive on-site conductivity study to support the initial design and installation of the anode and cathode array. Additionally, Lynntech conducted bench scale studies to facilitate a more thorough understanding of the environment and support system design, installation, and operation.

The site preparation activities involved the installation of the barrier wall, piezometers to be used to monitor the area, the cover, and the electrokinetic system. This was accomplished in January and February. The system was activated when coordination had been completed in March.

The system was operated according to the Demonstration Plan for approximately three months when a progress review was conducted at the Lynntech facility in College Station, Texas. During the review it was clear that the initial projections of an easy and straightforward cleanup were not accurate. Lynntech was unable to establish a pH front or the detectable movement of metals in the test cell. In addition, the chlorine and hydrogen sulfide scrubbers Lynntech had installed were not operating effectively and there was a need to redesign them.

Bench-scale studies conducted by Lynntech provided little useful information on the inability of the technology system to remove contaminants at NAWS Point Mugu. Lynntech's approach to the bench scale resulted in an experiment that used 24 times the current density than that used in the field system. Data concerning bench scale tests conducted by ERDC were also available. These tests, while not related to the Mugu site, were run at current densities approximately seven times that used in the field. Attempts to relate the laboratory studies (both Lynntech and ERDC) with field observations were inconclusive. All parties agreed that it was necessary to increase the current density in order to stimulate movement of ions. To accomplish this, the test cell size was reduced and the total available current applied to the remaining electrodes.

The system was operated in this mode for approximately 60 days, and Lynntech increased its process monitoring effort focusing on establishing the location and dynamics of the pH front, particularly in the vicinity of the anode and cathode wells. Further review of the systems operation and progress resulted in a decision to rate the technology as "not ready for commercialization" and terminate the demonstration project during the first week in October.

**Comments and Observations.** The following comments are intended to provide insights into the process as observed. It is based on observation and participation in briefings and discussions throughout the life of the project. The intent is not to fix blame but to point out processes, procedures, and areas where increased attention should be directed to further mature the technology. Based on the Point Mugu demonstration it is clear that the technology is not ready to be commercialized.

**Process.** While the process has been tested on a number of sites it has yet to enjoy success in a field environment. This was the case with Point Mugu where the system that was installed could not meet even preliminary success criteria. After six months of operation the system was not able to show any progress toward the removal of the targeted contaminants. This is due to:

**Problem.** Understanding the process dynamics. ERDC, Lynntech and other companies have conducted extensive laboratory and bench scale studies and reportedly some fieldwork. Data and analysis available from these studies have not provided any significant insights into the problems encountered at the Mugu site. Some of the site conditions were anticipated – production of chlorine, high electrical conductivity, etc. Some of the problems, such as hydrogen sulfide production, were not. These were all dealt with as they were encountered.

**Insight.** The site selected at NAWS Point Mugu was clearly a technical challenge. The degree of the challenge was not recognized until the process began to fail. Laboratory and bench scale work showed promise. What was clearly missed was recognizing the site-specific process drivers that may hinder or accelerate the process. Until the dynamics are understood better, there will be an element of research associated with the technology. To certify it ready for fielding, the process must be refined to a collection and assessment of site data, system design and installation, and system operation and evaluation.

**Problem.** Lynntech conducted an extensive bench scale test. The purpose of the bench scale is to replicate field conditions as closely as possible and to base critical design decisions on the data obtained. Lynntech went to great lengths to construct the pilot cells using material obtained from the site and to replicate anode and cathode physical conditions. They then applied current densities that were 24 times higher than they planned to use in the field. The rationale for this approach has not been made clear. The single conclusion that one might draw is that at high current densities the process can be driven.

**Insight.** The schedule for establishing an operating system in the field was aggressive because of the need to accommodate the Clapper Rail's nesting and mating habits. Lynntech was unable to conduct a proper bench scale study that would have permitted them to evaluate system design parameters and power requirements. The design was based on Lynntech's previous experience and the conductivity study completed prior to deployment. A logical connectivity between the field and bench current densities cannot be made.

**Problem.** The Lynntech process involved the collection of data needed to control the process. The sampling and control was well thought out and worked adequately. Lynntech demonstrated the ability to operate the test cell remotely with only occasional site visits. This demonstrated ability to sample and control remotely, while impressive, was not adequate to identify system operational problems and provide sufficient information concerning how the system could be adjusted to offset observed problems.

**Insight.** The problem associated with establishing process control is directly related to the fact that the site-specific drivers, especially those at NAWA Point Mugu, were not clearly understood. Therefore, although Lynntech was able to collect data, it is clear that the data collected was not sufficient to adequately establish control of the process.

**Problem.**

**Modeling.** During the demonstration there was no criterion developed to determine the pace of the process or if it was progressing as expected. This is reflected in the scheduling for the turn on of test cell #2 following an in-process review 90 days after treatment in test cell #1 began. The members of the team expected that Lynntech would have demonstrated the ability to move the metals of concern and control the process after three months of operation. When this time line was established, neither ERDC nor Lynntech expressed concern at meeting the schedule. Expectations before the system was turned on were that because of the high conductivity the system would be well on its way to cleaning up the site by the time the in-process review was conducted.

**Insight.** It would have been useful to collectively structure a performance model that would permit early and frequent evaluation of how well the system was performing. Lynntech had developed a process control model that failed to indicate performance flaws. The remainder of the team had no independent source of data on which to judge progress. Had this been done, it is possible that the system problems could have been detected earlier during the process.

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**APPENDIX A**

**POINTS OF CONTACT**



Gene L. Fabian, Project Manager  
US Army Environmental Center  
Attn: SFIM-AEC-ETD  
5179 Hoadley Road  
APG-EA, MD 21010-5401  
Ph: (410) 436-6847  
FAX: (410) 436-6836  
Gene.Fabian@aec.apgea.army.mil

Dr. Mark Bricka, Technical Consultant  
Engineer Research and Development Center  
Waterways Experiment Station  
3909 Halls Ferry Road  
Vicksburg, MS 39180-6199  
Ph: (601) 634-3700  
FAX: (601) 634-3833  
brickar@.wes.army.mil

Mr. Steve Granade  
Environmental Division Trailer 10073  
Corner of 12<sup>th</sup> St. and Laguna Rd.  
Point Mugu, CA 93042  
Ph: (805) 989-8389  
FAX: (805) 989-1011  
granadess@.cbcph.navy.mil

Dr. Thomas D. Rogers, Project Manager  
Lynntech, Inc.  
7610 Eastmark Drive, Suite 105  
College Station, TX 77840  
Ph: (409) 693-0017  
FAX: (409) 764-7479  
trogers@myriad.net

Dr. Dalibor Hodko, Electrochemist  
Lynntech, Inc.  
7610 Eastmark Drive, Suite 105  
College Station, TX 77840  
Ph: (409) 693-0017  
FAX: (409) 764-7479  
hodko@myriad.net

**APPENDIX B**

**DATA ARCHIVING AND DEMONSTRATION PLAN**

## **Data Archiving**

Data accumulated during the execution of the technology demonstration at Naval Air Weapons Station (NAWS) Point Mugu was stored and archived at the following locations:

1. Advancia Corporation, Environmental Services, Lawton, Oklahoma
2. NAWS Point Mugu, Lynntech, Inc. control trailer computers
3. Lynntech, Inc. facilities, College Station, Texas

Following the completion of the contract with the US Army Environmental Center (USAEC), Advancia Corporation (Advancia) transferred all data related to the contract and that transferred from the technology vendor, Lynntech, Inc. to USAEC.

## **Demonstration Plan**

A technology demonstration plan that contained the following three volumes is maintained by USAEC.

1. The Technology Demonstration Plan
2. Health & Safety Plans for all major subcontractors
3. Advancia Corporations Site Characterization

**APPENDIX C**

**ORGANIC SAMPLING DATA RESULTS**

# Organic Sampling Data By Well

Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>AW5-13</b>							
1,1,1,2-Tetrachloroethane							
13	2/12/99		ug/L	U		2	5
1,1,1-Trichloroethane							
13	2/12/99		ug/L	U		2	5
1,1,2,2-Tetrachloroethane							
13	2/12/99		ug/L	U		2	5
1,1,2-Trichloroethane							
13	2/12/99		ug/L	U		2	5
1,1-Dichloroethane							
13	2/12/99		ug/L	U		2	5
1,1-Dichloroethene							
13	2/12/99		ug/L	U		2	5
1,1-Dichloropropene							
13	2/12/99		ug/L	U		2	5
1,2,3-Trichlorobenzene							
13	2/12/99		ug/L	U		2	5
1,2,3-Trichloropropane							
13	2/12/99		ug/L	U		2	5
1,2,4-Trichlorobenzene							
13	2/12/99		ug/L	U		2	5
13	2/12/99		ug/L	U		2	10
1,2,4-Trimethylbenzene							
13	2/12/99		ug/L	U		2	5
1,2-Dibromo-3-chloropropane							
13	2/12/99		ug/L	U		2	5
1,2-Dibromoethane							
13	2/12/99		ug/L	U		2	5

Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichlorobenzene</b>							
13	2/12/99		ug/L	U		2	5
13	2/12/99		ug/L	U		2	10
<b>1,2-Dichloroethane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,2-Dichloropropane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,3,5-Trimethylbenzene</b>							
13	2/12/99		ug/L	U		2	5
<b>1,3-Dichlorobenzene</b>							
13	2/12/99		ug/L	U		2	5
13	2/12/99		ug/L	U		2	10
<b>1,3-Dichloropropane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,4-Dichlorobenzene</b>							
13	2/12/99		ug/L	U		2	5
13	2/12/99		ug/L	U		2	10
<b>2,2-Dichloropropane</b>							
13	2/12/99		ug/L	U		2	5
<b>2,4,5-Trichlorophenol</b>							
13	2/12/99		ug/L	U		10	50
<b>2,4,6-Trichlorophenol</b>							
13	2/12/99		ug/L	U		2	10
<b>2,4-Dichlorophenol</b>							
13	2/12/99		ug/L	U		2	10
<b>2,4-Dimethylphenol</b>							
13	2/12/99		ug/L	U		2	10
<b>2,4-Dinitrophenol</b>							
13	2/12/99		ug/L	U		10	50
<b>2,4-Dinitrotoluene</b>							
13	2/12/99		ug/L	U		2	10

## Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2,6-Dinitrotoluene	13	2/12/99		ug/L	U	10	50
2-Butanone	13	2/12/99		ug/L	U	2	10
2-Chloronaphthalene	13	2/12/99		ug/L	U	2	10
2-Chlorophenol	13	2/12/99		ug/L	U	2	10
2-Chlorotoluene	13	2/12/99		ug/L	U	2	5
2-Hexanone	13	2/12/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/12/99		ug/L	U	2	10
2-Methylphenol	13	2/12/99		ug/L	U	2	10
2-Nitroaniline	13	2/12/99		ug/L	U	10	50
2-Nitrophenol	13	2/12/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/12/99		ug/L	U	4	20
3-Nitroaniline	13	2/12/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/12/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/12/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/12/99		ug/L	U	2	10
4-Chloroaniline	13	2/12/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/12/99		ug/L	U	2	10

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Chlorotoluene	13	2/12/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/12/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/12/99		ug/L	U	2	10
4-Methylphenol	13	2/12/99		ug/L	U	2	10
4-Nitroaniline	13	2/12/99		ug/L	U	10	50
4-Nitrophenol	13	2/12/99		ug/L	U	10	50
Acenaphthene	13	2/12/99		ug/L	U	2	10
Acenaphthylene	13	2/12/99		ug/L	U	2	10
Acetone	13	2/12/99	20	ug/L	B	2	10
Acrylonitrile	13	2/12/99		ug/L	U	2	10
Anthracene	13	2/12/99		ug/L	U	2	10
Azobenzene	13	2/12/99		ug/L	U	10	50
Benzene	13	2/12/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/12/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/12/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/12/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/12/99		ug/L	U	2	10

## Volatile Organics

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PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 2 of 159

AW5-13



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Benzo(k)fluoranthene</b>							
13	2/12/99			ug/L	U	2	10
<b>Benzoic Acid</b>							
13	2/12/99			ug/L	U	10	50
<b>Benzyl Alcohol</b>							
13	2/12/99			ug/L	U	2	10
<b>Bis(2-chloroethoxy)methane</b>							
13	2/12/99			ug/L	U	2	10
<b>bis(2-Chloroethyl) Ether</b>							
13	2/12/99			ug/L	U	2	10
<b>bis(2-Chloroisopropyl) Ether</b>							
13	2/12/99			ug/L	U	2	10
<b>bis(2-ethylhexyl)phthalate</b>							
13	2/12/99			ug/L	U	2	10
<b>Bromobenzene</b>							
13	2/12/99			ug/L	U	2	5
<b>Bromochloromethane</b>							
13	2/12/99			ug/L	U	2	5
<b>Bromodichloromethane</b>							
13	2/12/99	5.1		ug/L		2	5
<b>Bromoform</b>							
13	2/12/99			ug/L	U	2	5
<b>Bromomethane</b>							
13	2/12/99			ug/L	U	2	10
<b>Butylbenzylphthalate</b>							
13	2/12/99			ug/L	U	2	10
<b>Carbon Disulfide</b>							
13	2/12/99	2.8		ug/L	J	2	5
<b>Carbon Tetrachloride</b>							
13	2/12/99			ug/L	U	2	5
<b>Chlorobenzene</b>							
13	2/12/99			ug/L	U	2	5
<b>Chloroethane</b>							
13	2/12/99			ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Chloroform</b>							
13	2/12/99	160		ug/L		2	5
<b>Chloromethane</b>							
13	2/12/99	2.1		ug/L	J	2	10
<b>Chrysene</b>							
13	2/12/99			ug/L	U	2	10
<b>cis-1,2-Dichloroethene</b>							
13	2/12/99			ug/L	U	2	5
<b>cis-1,3-Dichloropropene</b>							
13	2/12/99			ug/L	U	2	5
<b>Dibenzo(a,h)anthracene</b>							
13	2/12/99			ug/L	U	2	10
<b>Dibenzofuran</b>							
13	2/12/99			ug/L	U	2	10
<b>Dibromochloromethane</b>							
13	2/12/99			ug/L	U	2	5
<b>Dibromomethane</b>							
13	2/12/99			ug/L	U	2	5
<b>Dichlorodifluoromethane</b>							
13	2/12/99			ug/L	U	2	5
<b>Diethylphthalate</b>							
13	2/12/99			ug/L	U	2	10
<b>Dimethyl phthalate</b>							
13	2/12/99			ug/L	U	2	10
<b>Di-n-butylphthalate</b>							
13	2/12/99			ug/L	U	2	10
<b>di-n-octyl phthalate</b>							
13	2/12/99			ug/L	U	2	10
<b>Ethylbenzene</b>							
13	2/12/99			ug/L	U	2	5
<b>Fluoranthene</b>							
13	2/12/99			ug/L	U	2	10
<b>Fluorene</b>							
13	2/12/99			ug/L	U	2	10

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Page 3 of 159

AW5-13

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Hexachlorobenzene</b>							
	13	2/12/99		ug/L	U	2	10
<b>Hexachlorobutadiene</b>							
	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
<b>Hexachlorocyclopentadiene</b>							
	13	2/12/99		ug/L	U	2	10
<b>Hexachloroethane</b>							
	13	2/12/99		ug/L	U	2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
	13	2/12/99		ug/L	U	2	10
<b>Isophorone</b>							
	13	2/12/99		ug/L	U	2	10
<b>Isopropylbenzene</b>							
	13	2/12/99		ug/L	U	2	5
<b>Methylene Chloride</b>							
	13	2/12/99	5.8	ug/L		2	5
<b>Naphthalene</b>							
	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
<b>n-Butylbenzene</b>							
	13	2/12/99		ug/L	U	2	5
<b>Nitrobenzene</b>							
	13	2/12/99		ug/L	U	2	10
<b>n-Nitrosodimethylamine</b>							
	13	2/12/99		ug/L	U	2	10
<b>n-Nitroso-di-n-propylamine</b>							
	13	2/12/99		ug/L	U	2	10
<b>n-Nitrosodiphenylamine</b>							
	13	2/12/99		ug/L	U	2	10
<b>n-Propylbenzene</b>							
	13	2/12/99		ug/L	U	2	5
<b>Pentachlorophenol</b>							
	13	2/12/99		ug/L	U	10	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Phenanthrene</b>							
	13	2/12/99		ug/L	U	2	10
<b>Phenol</b>							
	13	2/12/99		ug/L	U	2	10
<b>Pyrene</b>							
	13	2/12/99		ug/L	U	2	10
<b>sec-Butylbenzene</b>							
	13	2/12/99		ug/L	U	2	5
<b>Styrene</b>							
	13	2/12/99		ug/L	U	2	5
<b>tert-Butylbenzene</b>							
	13	2/12/99		ug/L	U	2	5
<b>Tetrachloroethene</b>							
	13	2/12/99	11	ug/L		2	5
<b>Toluene</b>							
	13	2/12/99		ug/L	U	2	5
<b>trans-1,2-Dichloroethene</b>							
	13	2/12/99		ug/L	U	2	5
<b>trans-1,3-Dichloropropene</b>							
	13	2/12/99		ug/L	U	2	5
<b>Trichloroethene</b>							
	13	2/12/99	4	ug/L	J	2	5
<b>Trichlorofluoromethane</b>							
	13	2/12/99		ug/L	U	2	5
<b>Vinyl Chloride</b>							
	13	2/12/99	41	ug/L		2	10
<b>Xylenes (Total)</b>							
	13	2/12/99		ug/L	U	2	5

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Page 4 of 159

AW5-13

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>AW5-20</b>							
1,1,1,2-Tetrachloroethane	13	2/12/99		ug/L	U	200	500
1,1,1-Trichloroethane	13	2/12/99		ug/L	U	200	500
1,1,2,2-Tetrachloroethane	13	2/12/99		ug/L	U	200	500
1,1,2-Trichloroethane	13	2/12/99		ug/L	U	200	500
1,1-Dichloroethane	13	2/12/99		ug/L	U	200	500
1,1-Dichloroethene	13	2/12/99		ug/L	U	200	500
1,1-Dichloropropene	13	2/12/99		ug/L	U	200	500
1,2,3-Trichlorobenzene	13	2/12/99		ug/L	U	200	500
1,2,3-Trichloropropane	13	2/12/99		ug/L	U	200	500
1,2,4-Trichlorobenzene	13	2/12/99		ug/L	U	4	20
	13	2/12/99		ug/L	U	200	500
1,2,4-Trimethylbenzene	13	2/12/99		ug/L	U	200	500
1,2-Dibromo-3-chloropropane	13	2/12/99		ug/L	U	200	500
1,2-Dibromoethane	13	2/12/99		ug/L	U	200	500
1,2-Dichlorobenzene	13	2/12/99		ug/L	U	4	20
	13	2/12/99		ug/L	U	200	500
1,2-Dichloroethane	13	2/12/99		ug/L	U	200	500

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	200	500
<b>1,3,5-Trimethylbenzene</b>							
	13	2/12/99		ug/L	U	200	500
<b>1,3-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	200	500
	13	2/12/99		ug/L	U	4	20
<b>1,3-Dichloropropane</b>							
	13	2/12/99		ug/L	U	200	500
<b>1,4-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	4	20
	13	2/12/99		ug/L	U	200	500
<b>2,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	200	500
<b>2,4,5-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	20	100
<b>2,4,6-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dichlorophenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dimethylphenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dinitrophenol</b>							
	13	2/12/99		ug/L	U	20	100
<b>2,4-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,6-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	20	100
<b>2-Butanone</b>							
	13	2/12/99	290	ug/L	J	200	1000
<b>2-Chloronaphthalene</b>							
	13	2/12/99		ug/L	U	4	20
<b>2-Chlorophenol</b>							
	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

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J = analyte was detected at a value between MDL and PQL

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/12/99		ug/L	U	200	500
2-Hexanone	13	2/12/99		ug/L	U	200	1000
2-Methylnaphthalene	13	2/12/99		ug/L	U	4	20
2-Methylphenol	13	2/12/99		ug/L	U	4	20
2-Nitroaniline	13	2/12/99		ug/L	U	20	100
2-Nitrophenol	13	2/12/99		ug/L	U	4	20
3,3-Dichlorobenzidine	13	2/12/99		ug/L	U	8	40
3-Nitroaniline	13	2/12/99		ug/L	U	20	100
4,6-Dinitro-2-methylphenol	13	2/12/99		ug/L	U	20	100
4-Bromophenyl-phenylether	13	2/12/99		ug/L	U	4	20
4-Chloro-3-methylphenol	13	2/12/99		ug/L	U	4	20
4-Chloroaniline	13	2/12/99		ug/L	U	4	20
4-Chlorophenyl-phenylether	13	2/12/99		ug/L	U	4	20
4-Chlorotoluene	13	2/12/99		ug/L	U	200	500
4-Isopropyltoluene	13	2/12/99		ug/L	U	200	500
4-Methyl-2-Pentanone	13	2/12/99		ug/L	U	200	1000
4-Methylphenol	13	2/12/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/12/99		ug/L	U	20	100
4-Nitrophenol	13	2/12/99		ug/L	U	20	100
Acenaphthene	13	2/12/99		ug/L	U	4	20
Acenaphthylene	13	2/12/99		ug/L	U	4	20
Acetone	13	2/12/99	710	ug/L	J	200	1000
Acrylonitrile	13	2/12/99		ug/L	U	200	1000
Anthracene	13	2/12/99		ug/L	U	4	20
Azobenzene	13	2/12/99		ug/L	U	20	100
Benzene	13	2/12/99		ug/L	U	200	500
Benzo(a)anthracene	13	2/12/99		ug/L	U	4	20
Benzo(a)pyrene	13	2/12/99		ug/L	U	4	20
Benzo(b)fluoranthene	13	2/12/99		ug/L	U	4	20
Benzo(g,h,i)perylene	13	2/12/99		ug/L	U	4	20
Benzo(k)fluoranthene	13	2/12/99		ug/L	U	4	20
Benzoic Acid	13	2/12/99		ug/L	U	20	100
Benzyl Alcohol	13	2/12/99		ug/L	U	4	20
Bis(2-chloroethoxy)methane	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

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If no value is listed under results, analyte was not detected at or above the MDL

Page 6 of 159

AW5-20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/12/99		ug/L	U	4	20
bis(2-Chloroisopropyl) Ether	13	2/12/99		ug/L	U	4	20
bis(2-ethylhexyl)phthalate	13	2/12/99		ug/L	U	4	20
Bromobenzene	13	2/12/99		ug/L	U	200	500
Bromochloromethane	13	2/12/99		ug/L	U	200	500
Bromodichloromethane	13	2/12/99	8300	ug/L		200	500
Bromoform	13	2/12/99	1100	ug/L		200	500
Bromomethane	13	2/12/99		ug/L	U	200	1000
Butylbenzylphthalate	13	2/12/99		ug/L	U	4	20
Carbon Disulfide	13	2/12/99		ug/L	U	200	500
Carbon Tetrachloride	13	2/12/99		ug/L	U	200	500
Chlorobenzene	13	2/12/99		ug/L	U	200	500
Chloroethane	13	2/12/99		ug/L	U	200	1000
Chloroform	13	2/12/99	10000	ug/L		200	500
Chloromethane	13	2/12/99	340	ug/L	J	200	1000
Chrysene	13	2/12/99		ug/L	U	4	20
cis-1,2-Dichloroethene	13	2/12/99		ug/L	U	200	500

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/12/99		ug/L	U	200	500
Dibenzo(a,h)anthracene	13	2/12/99		ug/L	U	4	20
Dibenzofuran	13	2/12/99		ug/L	U	4	20
Dibromochloromethane	13	2/12/99	2900	ug/L		200	500
Dibromomethane	13	2/12/99		ug/L	U	200	500
Dichlorodifluoromethane	13	2/12/99		ug/L	U	200	500
Diethylphthalate	13	2/12/99		ug/L	U	4	20
Dimethyl phthalate	13	2/12/99		ug/L	U	4	20
Di-n-butylphthalate	13	2/12/99		ug/L	U	4	20
di-n-octyl phthalate	13	2/12/99		ug/L	U	4	20
Ethylbenzene	13	2/12/99		ug/L	U	200	500
Fluoranthene	13	2/12/99		ug/L	U	4	20
Fluorene	13	2/12/99		ug/L	U	4	20
Hexachlorobenzene	13	2/12/99		ug/L	U	4	20
Hexachlorobutadiene	13	2/12/99		ug/L	U	200	500
	13	2/12/99		ug/L	U	4	20
Hexachlorocyclopentadiene	13	2/12/99		ug/L	U	4	20

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/12/99		ug/L	U	4	20
Indeno(1,2,3-cd)pyrene	13	2/12/99		ug/L	U	4	20
Isophorone	13	2/12/99		ug/L	U	4	20
Isopropylbenzene	13	2/12/99		ug/L	U	200	500
Methylene Chloride	13	2/12/99		ug/L	U	200	500
Naphthalene	13	2/12/99		ug/L	U	200	500
	13	2/12/99		ug/L	U	4	20
n-Butylbenzene	13	2/12/99		ug/L	U	200	500
Nitrobenzene	13	2/12/99		ug/L	U	4	20
n-Nitrosodimethylamine	13	2/12/99		ug/L	U	4	20
n-Nitroso-di-n-propylamine	13	2/12/99		ug/L	U	4	20
n-Nitrosodiphenylamine	13	2/12/99		ug/L	U	4	20
n-Propylbenzene	13	2/12/99		ug/L	U	200	500
Pentachlorophenol	13	2/12/99		ug/L	U	20	100
Phenanthrene	13	2/12/99		ug/L	U	4	20
Phenol	13	2/12/99		ug/L	U	4	20
Pyrene	13	2/12/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/12/99		ug/L	U	200	500
Styrene	13	2/12/99		ug/L	U	200	500
tert-Butylbenzene	13	2/12/99		ug/L	U	200	500
Tetrachloroethene	13	2/12/99		ug/L	U	200	500
Toluene	13	2/12/99		ug/L	U	200	500
trans-1,2-Dichloroethene	13	2/12/99		ug/L	U	200	500
trans-1,3-Dichloropropene	13	2/12/99		ug/L	U	200	500
Trichloroethene	13	2/12/99		ug/L	U	200	500
Trichlorofluoromethane	13	2/12/99		ug/L	U	200	500
Vinyl Chloride	13	2/12/99		ug/L	U	200	1000
Xylenes (Total)	13	2/12/99		ug/L	U	200	500

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>AW5-20D</b>							
1,1,1,2-Tetrachloroethane	13	2/12/99		ug/L	U	200	500
1,1,1-Trichloroethane	13	2/12/99		ug/L	U	200	500
1,1,2,2-Tetrachloroethane	13	2/12/99		ug/L	U	200	500
1,1,2-Trichloroethane	13	2/12/99		ug/L	U	200	500
1,1-Dichloroethane	13	2/12/99		ug/L	U	200	500
1,1-Dichloroethene	13	2/12/99		ug/L	U	200	500
1,1-Dichloropropene	13	2/12/99		ug/L	U	200	500
1,2,3-Trichlorobenzene	13	2/12/99		ug/L	U	200	500
1,2,3-Trichloropropane	13	2/12/99		ug/L	U	200	500
1,2,4-Trichlorobenzene	13	2/12/99		ug/L	U	4	20
1,2,4-Trimethylbenzene	13	2/12/99		ug/L	U	200	500
1,2-Dibromo-3-chloropropane	13	2/12/99		ug/L	U	200	500
1,2-Dibromoethane	13	2/12/99		ug/L	U	200	500
1,2-Dichlorobenzene	13	2/12/99		ug/L	U	200	500
	13	2/12/99		ug/L	U	4	20
1,2-Dichloroethane	13	2/12/99		ug/L	U	200	500

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	200	500
<b>1,3,5-Trimethylbenzene</b>							
	13	2/12/99		ug/L	U	200	500
<b>1,3-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	200	500
	13	2/12/99		ug/L	U	4	20
<b>1,3-Dichloropropane</b>							
	13	2/12/99		ug/L	U	200	500
<b>1,4-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	200	500
	13	2/12/99		ug/L	U	4	20
<b>2,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	200	500
<b>2,4,5-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	20	100
<b>2,4,6-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dichlorophenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dimethylphenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dinitrophenol</b>							
	13	2/12/99		ug/L	U	20	100
<b>2,4-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,6-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	20	100
<b>2-Butanone</b>							
	13	2/12/99		ug/L	U	200	1000
<b>2-Chloronaphthalene</b>							
	13	2/12/99		ug/L	U	4	20
<b>2-Chlorophenol</b>							
	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 9 of 159

AW5-20D



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/12/99		ug/L	U	200	500
2-Hexanone	13	2/12/99		ug/L	U	200	1000
2-Methylnaphthalene	13	2/12/99		ug/L	U	4	20
2-Methylphenol	13	2/12/99		ug/L	U	4	20
2-Nitroaniline	13	2/12/99		ug/L	U	20	100
2-Nitrophenol	13	2/12/99		ug/L	U	4	20
3,3-Dichlorobenzidine	13	2/12/99		ug/L	U	8	40
3-Nitroaniline	13	2/12/99		ug/L	U	20	100
4,6-Dinitro-2-methylphenol	13	2/12/99		ug/L	U	20	100
4-Bromophenyl-phenylether	13	2/12/99		ug/L	U	4	20
4-Chloro-3-methylphenol	13	2/12/99		ug/L	U	4	20
4-Chloroaniline	13	2/12/99		ug/L	U	4	20
4-Chlorophenyl-phenylether	13	2/12/99		ug/L	U	4	20
4-Chlorotoluene	13	2/12/99		ug/L	U	200	500
4-Isopropyltoluene	13	2/12/99		ug/L	U	200	500
4-Methyl-2-Pentanone	13	2/12/99		ug/L	U	200	1000
4-Methylphenol	13	2/12/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/12/99		ug/L	U	20	100
4-Nitrophenol	13	2/12/99		ug/L	U	20	100
Acenaphthene	13	2/12/99		ug/L	U	4	20
Acenaphthylene	13	2/12/99		ug/L	U	4	20
Acetone	13	2/12/99	620	ug/L	J	200	1000
Acrylonitrile	13	2/12/99		ug/L	U	200	1000
Anthracene	13	2/12/99		ug/L	U	4	20
Azobenzene	13	2/12/99		ug/L	U	20	100
Benzene	13	2/12/99		ug/L	U	200	500
Benzo(a)anthracene	13	2/12/99		ug/L	U	4	20
Benzo(a)pyrene	13	2/12/99		ug/L	U	4	20
Benzo(b)fluoranthene	13	2/12/99		ug/L	U	4	20
Benzo(g,h,i)perylene	13	2/12/99		ug/L	U	4	20
Benzo(k)fluoranthene	13	2/12/99		ug/L	U	4	20
Benzoic Acid	13	2/12/99		ug/L	U	20	100
Benzyl Alcohol	13	2/12/99		ug/L	U	4	20
Bis(2-chloroethoxy)methane	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

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MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 10 of 159

AW5-20D

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/12/99		ug/L	U	4	20
bis(2-Chloroisopropyl) Ether	13	2/12/99		ug/L	U	4	20
bis(2-ethylhexyl)phthalate	13	2/12/99		ug/L	U	4	20
Bromobenzene	13	2/12/99		ug/L	U	200	500
Bromochloromethane	13	2/12/99		ug/L	U	200	500
Bromodichloromethane	13	2/12/99	7700	ug/L		200	500
Bromoform	13	2/12/99	1000	ug/L		200	500
Bromomethane	13	2/12/99		ug/L	U	200	1000
Butylbenzylphthalate	13	2/12/99		ug/L	U	4	20
Carbon Disulfide	13	2/12/99	260	ug/L	J	200	500
Carbon Tetrachloride	13	2/12/99		ug/L	U	200	500
Chlorobenzene	13	2/12/99		ug/L	U	200	500
Chloroethane	13	2/12/99		ug/L	U	200	1000
Chloroform	13	2/12/99	9600	ug/L		200	500
Chloromethane	13	2/12/99	260	ug/L	J	200	1000
Chrysene	13	2/12/99		ug/L	U	4	20
cis-1,2-Dichloroethene	13	2/12/99		ug/L	U	200	500

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/12/99		ug/L	U	200	500
Dibenzo(a,h)anthracene	13	2/12/99		ug/L	U	4	20
Dibenzofuran	13	2/12/99		ug/L	U	4	20
Dibromochloromethane	13	2/12/99		ug/L	U	200	500
Dibromomethane	13	2/12/99		ug/L	U	200	500
Dichlorodifluoromethane	13	2/12/99		ug/L	U	200	500
Diethylphthalate	13	2/12/99		ug/L	U	4	20
Dimethyl phthalate	13	2/12/99		ug/L	U	4	20
Di-n-butylphthalate	13	2/12/99		ug/L	U	4	20
di-n-octyl phthalate	13	2/12/99		ug/L	U	4	20
Ethylbenzene	13	2/12/99		ug/L	U	200	500
Fluoranthene	13	2/12/99		ug/L	U	4	20
Fluorene	13	2/12/99		ug/L	U	4	20
Hexachlorobenzene	13	2/12/99		ug/L	U	4	20
Hexachlorobutadiene	13	2/12/99		ug/L	U	200	500
	13	2/12/99		ug/L	U	4	20
Hexachlorocyclopentadiene	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

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MDL = Method Detection Limit

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PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane							
13	2/12/99		ug/L	U	4	20	
Indeno(1,2,3-cd)pyrene							
13	2/12/99		ug/L	U	4	20	
Isophorone							
13	2/12/99		ug/L	U	4	20	
Isopropylbenzene							
13	2/12/99		ug/L	U	200	500	
Methylene Chloride							
13	2/12/99		ug/L	U	200	500	
Naphthalene							
13	2/12/99		ug/L	U	4	20	
13	2/12/99		ug/L	U	200	500	
Nitrobenzene							
13	2/12/99		ug/L	U	4	20	
n-Nitrosodimethylamine							
13	2/12/99		ug/L	U	4	20	
n-Nitroso-di-n-propylamine							
13	2/12/99		ug/L	U	4	20	
n-Nitrosodiphenylamine							
13	2/12/99		ug/L	U	4	20	
n-Propylbenzene							
13	2/12/99		ug/L	U	200	500	
Pentachlorophenol							
13	2/12/99		ug/L	U	20	100	
Phenanthrene							
13	2/12/99		ug/L	U	4	20	
Phenol							
13	2/12/99		ug/L	U	4	20	
Pyrene							
13	2/12/99		ug/L	U	4	20	
sec-Butylbenzene							
13	2/12/99		ug/L	U	200	500	

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Styrene							
13	2/12/99		ug/L	U	200	500	
tert-Butylbenzene							
13	2/12/99		ug/L	U	200	500	
Tetrachloroethene							
13	2/12/99		ug/L	U	200	500	
Toluene							
13	2/12/99		ug/L	U	200	500	
trans-1,2-Dichloroethene							
13	2/12/99		ug/L	U	200	500	
trans-1,3-Dichloropropene							
13	2/12/99		ug/L	U	200	500	
Trichloroethene							
13	2/12/99		ug/L	U	200	500	
Trichlorofluoromethane							
13	2/12/99		ug/L	U	200	500	
Vinyl Chloride							
13	2/12/99		ug/L	U	200	1000	
Xylenes (Total)							
13	2/12/99		ug/L	U	200	500	

**Volatile Organics**

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J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 12 of 159

AW5-20D

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>AW5-23</b>							
<b>1,1,1,2-Tetrachloroethane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,1,1-Trichloroethane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,1,2,2-Tetrachloroethane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,1,2-Trichloroethane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,1-Dichloroethane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,1-Dichloroethene</b>							
13	2/12/99		ug/L	U		2	5
<b>1,1-Dichloropropene</b>							
13	2/12/99		ug/L	U		2	5
<b>1,2,3-Trichlorobenzene</b>							
13	2/12/99		ug/L	U		2	5
<b>1,2,3-Trichloropropane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,2,4-Trichlorobenzene</b>							
13	2/12/99		ug/L	U		2	5
13	2/12/99		ug/L	U		2	10
<b>1,2,4-Trimethylbenzene</b>							
13	2/12/99		ug/L	U		2	5
<b>1,2-Dibromo-3-chloropropane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,2-Dibromoethane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,2-Dichlorobenzene</b>							
13	2/12/99		ug/L	U		2	10
13	2/12/99		ug/L	U		2	5
<b>1,2-Dichloroethane</b>							
13	2/12/99		ug/L	U		2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,3,5-Trimethylbenzene</b>							
13	2/12/99		ug/L	U		2	5
<b>1,3-Dichlorobenzene</b>							
13	2/12/99		ug/L	U		2	5
13	2/12/99		ug/L	U		2	10
<b>1,3-Dichloropropane</b>							
13	2/12/99		ug/L	U		2	5
<b>1,4-Dichlorobenzene</b>							
13	2/12/99		ug/L	U		2	5
13	2/12/99		ug/L	U		2	10
<b>2,2-Dichloropropane</b>							
13	2/12/99		ug/L	U		2	5
<b>2,4,5-Trichlorophenol</b>							
13	2/12/99		ug/L	U		10	50
<b>2,4,6-Trichlorophenol</b>							
13	2/12/99		ug/L	U		2	10
<b>2,4-Dichlorophenol</b>							
13	2/12/99		ug/L	U		2	10
<b>2,4-Dimethylphenol</b>							
13	2/12/99		ug/L	U		2	10
<b>2,4-Dinitrophenol</b>							
13	2/12/99		ug/L	U		10	50
<b>2,4-Dinitrotoluene</b>							
13	2/12/99		ug/L	U		2	10
<b>2,6-Dinitrotoluene</b>							
13	2/12/99		ug/L	U		10	50
<b>2-Butanone</b>							
13	2/12/99	19	ug/L			2	10
<b>2-Chloronaphthalene</b>							
13	2/12/99		ug/L	U		2	10
<b>2-Chlorophenol</b>							
13	2/12/99		ug/L	U		2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/12/99		ug/L	U	2	5
2-Hexanone	13	2/12/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/12/99		ug/L	U	2	10
2-Methylphenol	13	2/12/99		ug/L	U	2	10
2-Nitroaniline	13	2/12/99		ug/L	U	10	50
2-Nitrophenol	13	2/12/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/12/99		ug/L	U	4	20
3-Nitroaniline	13	2/12/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/12/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/12/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/12/99		ug/L	U	2	10
4-Chloroaniline	13	2/12/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/12/99		ug/L	U	2	10
4-Chlorotoluene	13	2/12/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/12/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/12/99		ug/L	U	2	10
4-Methylphenol	13	2/12/99		ug/L	U	2	10

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/12/99		ug/L	U	10	50
4-Nitrophenol	13	2/12/99		ug/L	U	10	50
Acenaphthene	13	2/12/99		ug/L	U	2	10
Acenaphthylene	13	2/12/99		ug/L	U	2	10
Acetone	13	2/12/99	22	ug/L		2	10
Acrylonitrile	13	2/12/99		ug/L	U	2	10
Anthracene	13	2/12/99		ug/L	U	2	10
Azobenzene	13	2/12/99		ug/L	U	10	50
Benzene	13	2/12/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/12/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/12/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/12/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/12/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/12/99		ug/L	U	2	10
Benzoic Acid	13	2/12/99		ug/L	U	10	50
Benzyl Alcohol	13	2/12/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/12/99		ug/L	U	2	10

## Volatile Organics

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J = analyte was detected at a value between MDL and PQL

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/12/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/12/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/12/99		ug/L	U	2	10
Bromobenzene	13	2/12/99		ug/L	U	2	5
Bromochloromethane	13	2/12/99	7.8	ug/L		2	5
Bromodichloromethane	13	2/12/99	2.5	ug/L	J	2	5
Bromoform	13	2/12/99		ug/L	U	2	5
Bromomethane	13	2/12/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/12/99		ug/L	U	2	10
Carbon Disulfide	13	2/12/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/12/99		ug/L	U	2	5
Chlorobenzene	13	2/12/99		ug/L	U	2	5
Chloroethane	13	2/12/99		ug/L	U	2	10
Chloroform	13	2/12/99	79	ug/L		2	5
Chloromethane	13	2/12/99	3.5	ug/L	J	2	10
Chrysene	13	2/12/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/12/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/12/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/12/99		ug/L	U	2	10
Dibenzofuran	13	2/12/99		ug/L	U	2	10
Dibromochloromethane	13	2/12/99		ug/L	U	2	5
Dibromomethane	13	2/12/99	8.6	ug/L		2	5
Dichlorodifluoromethane	13	2/12/99		ug/L	U	2	5
Diethylphthalate	13	2/12/99		ug/L	U	2	10
Dimethyl phthalate	13	2/12/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/12/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/12/99		ug/L	U	2	10
Ethylbenzene	13	2/12/99		ug/L	U	2	5
Fluoranthene	13	2/12/99		ug/L	U	2	10
Fluorene	13	2/12/99		ug/L	U	2	10
Hexachlorobenzene	13	2/12/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/12/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/12/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/12/99		ug/L	U	2	10
Isophorone	13	2/12/99		ug/L	U	2	10
Isopropylbenzene	13	2/12/99		ug/L	U	2	5
Methylene Chloride	13	2/12/99	8.8	ug/L		2	5
Naphthalene	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
n-Butylbenzene	13	2/12/99		ug/L	U	2	5
Nitrobenzene	13	2/12/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/12/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/12/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/12/99		ug/L	U	2	10
n-Propylbenzene	13	2/12/99		ug/L	U	2	5
Pentachlorophenol	13	2/12/99		ug/L	U	10	50
Phenanthrene	13	2/12/99		ug/L	U	2	10
Phenol	13	2/12/99		ug/L	U	2	10
Pyrene	13	2/12/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/12/99		ug/L	U	2	5
Styrene	13	2/12/99		ug/L	U	2	5
tert-Butylbenzene	13	2/12/99		ug/L	U	2	5
Tetrachloroethene	13	2/12/99		ug/L	U	2	5
Toluene	13	2/12/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/12/99	3.9	ug/L	J	2	5
trans-1,3-Dichloropropene	13	2/12/99		ug/L	U	2	5
Trichloroethene	13	2/12/99		ug/L	U	2	5
Trichlorofluoromethane	13	2/12/99		ug/L	U	2	5
Vinyl Chloride	13	2/12/99	3.3	ug/L	J	2	10
Xylenes (Total)	13	2/12/99		ug/L	U	2	5

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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MDL = Method Detection Limit

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PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 16 of 159

AW5-23



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>CW5-11</b>							
1,1,1,2-Tetrachloroethane	13	2/12/99		ug/L	U	20	50
1,1,1-Trichloroethane	13	2/12/99		ug/L	U	20	50
1,1,2,2-Tetrachloroethane	13	2/12/99		ug/L	U	20	50
1,1,2-Trichloroethane	13	2/12/99		ug/L	U	20	50
1,1-Dichloroethane	13	2/12/99		ug/L	U	20	50
1,1-Dichloroethene	13	2/12/99		ug/L	U	20	50
1,1-Dichloropropene	13	2/12/99		ug/L	U	20	50
1,2,3-Trichlorobenzene	13	2/12/99		ug/L	U	20	50
1,2,3-Trichloropropane	13	2/12/99		ug/L	U	20	50
1,2,4-Trichlorobenzene	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
1,2,4-Trimethylbenzene	13	2/12/99		ug/L	U	20	50
1,2-Dibromo-3-chloropropane	13	2/12/99		ug/L	U	20	50
1,2-Dibromoethane	13	2/12/99		ug/L	U	20	50
1,2-Dichlorobenzene	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
1,2-Dichloroethane	13	2/12/99		ug/L	U	20	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	20	50
<b>1,3,5-Trimethylbenzene</b>							
	13	2/12/99		ug/L	U	20	50
<b>1,3-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
<b>1,3-Dichloropropane</b>							
	13	2/12/99		ug/L	U	20	50
<b>1,4-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
<b>2,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	20	50
<b>2,4,5-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	20	100
<b>2,4,6-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dichlorophenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dimethylphenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dinitrophenol</b>							
	13	2/12/99		ug/L	U	20	100
<b>2,4-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,6-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	20	100
<b>2-Butanone</b>							
	13	2/12/99	990	ug/L		20	100
<b>2-Chloronaphthalene</b>							
	13	2/12/99		ug/L	U	4	20
<b>2-Chlorophenol</b>							
	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/12/99		ug/L	U	20	50
2-Hexanone	13	2/12/99		ug/L	U	20	100
2-Methylnaphthalene	13	2/12/99		ug/L	U	4	20
2-Methylphenol	13	2/12/99		ug/L	U	4	20
2-Nitroaniline	13	2/12/99		ug/L	U	20	100
2-Nitrophenol	13	2/12/99		ug/L	U	4	20
3,3-Dichlorobenzidine	13	2/12/99		ug/L	U	8	40
3-Nitroaniline	13	2/12/99		ug/L	U	20	100
4,6-Dinitro-2-methylphenol	13	2/12/99		ug/L	U	20	100
4-Bromophenyl-phenylether	13	2/12/99		ug/L	U	4	20
4-Chloro-3-methylphenol	13	2/12/99		ug/L	U	4	20
4-Chloroaniline	13	2/12/99		ug/L	U	4	20
4-Chlorophenyl-phenylether	13	2/12/99		ug/L	U	4	20
4-Chlorotoluene	13	2/12/99		ug/L	U	20	50
4-Isopropyltoluene	13	2/12/99		ug/L	U	20	50
4-Methyl-2-Pentanone	13	2/12/99		ug/L	U	20	100
4-Methylphenol	13	2/12/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/12/99		ug/L	U	20	100
4-Nitrophenol	13	2/12/99		ug/L	U	20	100
Acenaphthene	13	2/12/99		ug/L	U	4	20
Acenaphthylene	13	2/12/99		ug/L	U	4	20
Acetone	13	2/12/99	510	ug/L		20	100
Acrylonitrile	13	2/12/99		ug/L	U	20	100
Anthracene	13	2/12/99		ug/L	U	4	20
Azobenzene	13	2/12/99		ug/L	U	20	100
Benzene	13	2/12/99		ug/L	U	20	50
Benzo(a)anthracene	13	2/12/99		ug/L	U	4	20
Benzo(a)pyrene	13	2/12/99		ug/L	U	4	20
Benzo(b)fluoranthene	13	2/12/99		ug/L	U	4	20
Benzo(g,h,i)perylene	13	2/12/99		ug/L	U	4	20
Benzo(k)fluoranthene	13	2/12/99		ug/L	U	4	20
Benzoic Acid	13	2/12/99		ug/L	U	20	100
Benzyl Alcohol	13	2/12/99		ug/L	U	4	20
Bis(2-chloroethoxy)methane	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

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PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/12/99		ug/L	U	4	20
bis(2-Chloroisopropyl) Ether	13	2/12/99		ug/L	U	4	20
bis(2-ethylhexyl)phthalate	13	2/12/99		ug/L	U	4	20
Bromobenzene	13	2/12/99		ug/L	U	20	50
Bromochloromethane	13	2/12/99		ug/L	U	20	50
Bromodichloromethane	13	2/12/99		ug/L	U	20	50
Bromoform	13	2/12/99		ug/L	U	20	50
Bromomethane	13	2/12/99		ug/L	U	20	100
Butylbenzylphthalate	13	2/12/99		ug/L	U	4	20
Carbon Disulfide	13	2/12/99	41	ug/L	J	20	50
Carbon Tetrachloride	13	2/12/99		ug/L	U	20	50
Chlorobenzene	13	2/12/99		ug/L	U	20	50
Chloroethane	13	2/12/99		ug/L	U	20	100
Chloroform	13	2/12/99	220	ug/L		20	50
Chloromethane	13	2/12/99		ug/L	U	20	100
Chrysene	13	2/12/99		ug/L	U	4	20
cis-1,2-Dichloroethene	13	2/12/99		ug/L	U	20	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/12/99		ug/L	U	20	50
Dibenzo(a,h)anthracene	13	2/12/99		ug/L	U	4	20
Dibenzofuran	13	2/12/99		ug/L	U	4	20
Dibromochloromethane	13	2/12/99		ug/L	U	20	50
Dibromomethane	13	2/12/99		ug/L	U	20	50
Dichlorodifluoromethane	13	2/12/99		ug/L	U	20	50
Diethylphthalate	13	2/12/99		ug/L	U	4	20
Dimethyl phthalate	13	2/12/99		ug/L	U	4	20
Di-n-butylphthalate	13	2/12/99		ug/L	U	4	20
di-n-octyl phthalate	13	2/12/99		ug/L	U	4	20
Ethylbenzene	13	2/12/99		ug/L	U	20	50
Fluoranthene	13	2/12/99		ug/L	U	4	20
Fluorene	13	2/12/99		ug/L	U	4	20
Hexachlorobenzene	13	2/12/99		ug/L	U	4	20
Hexachlorobutadiene	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
Hexachlorocyclopentadiene	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Hexachloroethane</b>							
	13	2/12/99		ug/L	U	4	20
<b>Indeno(1,2,3-cd)pyrene</b>							
	13	2/12/99		ug/L	U	4	20
<b>Isophorone</b>							
	13	2/12/99		ug/L	U	4	20
<b>Isopropylbenzene</b>							
	13	2/12/99		ug/L	U	20	50
<b>Methylene Chloride</b>							
	13	2/12/99	56	ug/L		20	50
<b>Naphthalene</b>							
	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
<b>n-Butylbenzene</b>							
	13	2/12/99		ug/L	U	20	50
<b>Nitrobenzene</b>							
	13	2/12/99		ug/L	U	4	20
<b>n-Nitrosodimethylamine</b>							
	13	2/12/99		ug/L	U	4	20
<b>n-Nitroso-di-n-propylamine</b>							
	13	2/12/99		ug/L	U	4	20
<b>n-Nitrosodiphenylamine</b>							
	13	2/12/99		ug/L	U	4	20
<b>n-Propylbenzene</b>							
	13	2/12/99		ug/L	U	20	50
<b>Pentachlorophenol</b>							
	13	2/12/99		ug/L	U	20	100
<b>Phenanthrene</b>							
	13	2/12/99		ug/L	U	4	20
<b>Phenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>Pyrene</b>							
	13	2/12/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>sec-Butylbenzene</b>							
	13	2/12/99		ug/L	U	20	50
<b>Styrene</b>							
	13	2/12/99		ug/L	U	20	50
<b>tert-Butylbenzene</b>							
	13	2/12/99		ug/L	U	20	50
<b>Tetrachloroethene</b>							
	13	2/12/99		ug/L	U	20	50
<b>Toluene</b>							
	13	2/12/99		ug/L	U	20	50
<b>trans-1,2-Dichloroethene</b>							
	13	2/12/99		ug/L	U	20	50
<b>trans-1,3-Dichloropropene</b>							
	13	2/12/99		ug/L	U	20	50
<b>Trichloroethene</b>							
	13	2/12/99		ug/L	U	20	50
<b>Trichlorofluoromethane</b>							
	13	2/12/99		ug/L	U	20	50
<b>Vinyl Chloride</b>							
	13	2/12/99	32	ug/L	J	20	100
<b>Xylenes (Total)</b>							
	13	2/12/99		ug/L	U	20	50

**Volatile Organics**

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MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>CW5-12</b>							
1,1,1,2-Tetrachloroethane	13	2/12/99		ug/L	U	20	50
1,1,1-Trichloroethane	13	2/12/99		ug/L	U	20	50
1,1,2,2-Tetrachloroethane	13	2/12/99		ug/L	U	20	50
1,1,2-Trichloroethane	13	2/12/99		ug/L	U	20	50
1,1-Dichloroethane	13	2/12/99		ug/L	U	20	50
1,1-Dichloroethene	13	2/12/99		ug/L	U	20	50
1,1-Dichloropropene	13	2/12/99		ug/L	U	20	50
1,2,3-Trichlorobenzene	13	2/12/99		ug/L	U	20	50
1,2,3-Trichloropropane	13	2/12/99		ug/L	U	20	50
1,2,4-Trichlorobenzene	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
1,2,4-Trimethylbenzene	13	2/12/99		ug/L	U	20	50
1,2-Dibromo-3-chloropropane	13	2/12/99		ug/L	U	20	50
1,2-Dibromoethane	13	2/12/99		ug/L	U	20	50
1,2-Dichlorobenzene	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
1,2-Dichloroethane	13	2/12/99		ug/L	U	20	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
1,2-Dichloropropane	13	2/12/99		ug/L	U	20	50
1,3,5-Trimethylbenzene	13	2/12/99		ug/L	U	20	50
1,3-Dichlorobenzene	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
1,3-Dichloropropane	13	2/12/99		ug/L	U	20	50
1,4-Dichlorobenzene	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
2,2-Dichloropropane	13	2/12/99		ug/L	U	20	50
2,4,5-Trichlorophenol	13	2/12/99		ug/L	U	20	100
2,4,6-Trichlorophenol	13	2/12/99		ug/L	U	4	20
2,4-Dichlorophenol	13	2/12/99		ug/L	U	4	20
2,4-Dimethylphenol	13	2/12/99		ug/L	U	4	20
2,4-Dinitrophenol	13	2/12/99		ug/L	U	20	100
2,4-Dinitrotoluene	13	2/12/99		ug/L	U	4	20
2,6-Dinitrotoluene	13	2/12/99		ug/L	U	20	100
2-Butanone	13	2/12/99	2500	ug/L		100	500
2-Chloronaphthalene	13	2/12/99		ug/L	U	4	20
2-Chlorophenol	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

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MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/12/99		ug/L	U	20	50
2-Hexanone	13	2/12/99		ug/L	U	20	100
2-Methylnaphthalene	13	2/12/99		ug/L	U	4	20
2-Methylphenol	13	2/12/99		ug/L	U	4	20
2-Nitroaniline	13	2/12/99		ug/L	U	20	100
2-Nitrophenol	13	2/12/99		ug/L	U	4	20
3,3-Dichlorobenzidine	13	2/12/99		ug/L	U	8	40
3-Nitroaniline	13	2/12/99		ug/L	U	20	100
4,6-Dinitro-2-methylphenol	13	2/12/99		ug/L	U	20	100
4-Bromophenyl-phenylether	13	2/12/99		ug/L	U	4	20
4-Chloro-3-methylphenol	13	2/12/99		ug/L	U	4	20
4-Chloroaniline	13	2/12/99		ug/L	U	4	20
4-Chlorophenyl-phenylether	13	2/12/99		ug/L	U	4	20
4-Chlorotoluene	13	2/12/99		ug/L	U	20	50
4-Isopropyltoluene	13	2/12/99		ug/L	U	20	50
4-Methyl-2-Pentanone	13	2/12/99		ug/L	U	20	100
4-Methylphenol	13	2/12/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/12/99		ug/L	U	20	100
4-Nitrophenol	13	2/12/99		ug/L	U	20	100
Acenaphthene	13	2/12/99		ug/L	U	4	20
Acenaphthylene	13	2/12/99		ug/L	U	4	20
Acetone	13	2/12/99	1300	ug/L		20	100
Acrylonitrile	13	2/12/99		ug/L	U	20	100
Anthracene	13	2/12/99		ug/L	U	4	20
Azobenzene	13	2/12/99		ug/L	U	20	100
Benzene	13	2/12/99		ug/L	U	20	50
Benzo(a)anthracene	13	2/12/99		ug/L	U	4	20
Benzo(a)pyrene	13	2/12/99		ug/L	U	4	20
Benzo(b)fluoranthene	13	2/12/99		ug/L	U	4	20
Benzo(g,h,i)perylene	13	2/12/99		ug/L	U	4	20
Benzo(k)fluoranthene	13	2/12/99		ug/L	U	4	20
Benzoic Acid	13	2/12/99		ug/L	U	20	100
Benzyl Alcohol	13	2/12/99		ug/L	U	4	20
Bis(2-chloroethoxy)methane	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/12/99		ug/L	U	4	20
bis(2-Chloroisopropyl) Ether	13	2/12/99		ug/L	U	4	20
bis(2-ethylhexyl)phthalate	13	2/12/99		ug/L	U	4	20
Bromobenzene	13	2/12/99		ug/L	U	20	50
Bromochloromethane	13	2/12/99		ug/L	U	20	50
Bromodichloromethane	13	2/12/99		ug/L	U	20	50
Bromoform	13	2/12/99		ug/L	U	20	50
Bromomethane	13	2/12/99		ug/L	U	20	100
Butylbenzylphthalate	13	2/12/99		ug/L	U	4	20
Carbon Disulfide	13	2/12/99	41	ug/L	J	20	50
Carbon Tetrachloride	13	2/12/99		ug/L	U	20	50
Chlorobenzene	13	2/12/99		ug/L	U	20	50
Chloroethane	13	2/12/99		ug/L	U	20	100
Chloroform	13	2/12/99	170	ug/L		20	50
Chloromethane	13	2/12/99		ug/L	U	20	100
Chrysene	13	2/12/99		ug/L	U	4	20
cis-1,2-Dichloroethene	13	2/12/99		ug/L	U	20	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/12/99		ug/L	U	20	50
Dibenzo(a,h)anthracene	13	2/12/99		ug/L	U	4	20
Dibenzofuran	13	2/12/99		ug/L	U	4	20
Dibromochloromethane	13	2/12/99		ug/L	U	20	50
Dibromomethane	13	2/12/99		ug/L	U	20	50
Dichlorodifluoromethane	13	2/12/99		ug/L	U	20	50
Diethylphthalate	13	2/12/99		ug/L	U	4	20
Dimethyl phthalate	13	2/12/99		ug/L	U	4	20
Di-n-butylphthalate	13	2/12/99		ug/L	U	4	20
di-n-octyl phthalate	13	2/12/99		ug/L	U	4	20
Ethylbenzene	13	2/12/99		ug/L	U	20	50
Fluoranthene	13	2/12/99		ug/L	U	4	20
Fluorene	13	2/12/99		ug/L	U	4	20
Hexachlorobenzene	13	2/12/99		ug/L	U	4	20
Hexachlorobutadiene	13	2/12/99		ug/L	U	4	20
	13	2/12/99		ug/L	U	20	50
Hexachlorocyclopentadiene	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 23 of 159

CW5-12

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane							
	13	2/12/99		ug/L	U	4	20
Indeno(1,2,3-cd)pyrene							
	13	2/12/99		ug/L	U	4	20
Isophorone							
	13	2/12/99		ug/L	U	4	20
Isopropylbenzene							
	13	2/12/99		ug/L	U	20	50
Methylene Chloride							
	13	2/12/99		ug/L	U	20	50
Naphthalene							
	13	2/12/99		ug/L	U	4	20
	13	2/12/99		ug/L	U	20	50
n-Butylbenzene							
	13	2/12/99		ug/L	U	20	50
Nitrobenzene							
	13	2/12/99		ug/L	U	4	20
n-Nitrosodimethylamine							
	13	2/12/99		ug/L	U	4	20
n-Nitroso-di-n-propylamine							
	13	2/12/99		ug/L	U	4	20
n-Nitrosodiphenylamine							
	13	2/12/99		ug/L	U	4	20
n-Propylbenzene							
	13	2/12/99		ug/L	U	20	50
Pentachlorophenol							
	13	2/12/99		ug/L	U	20	100
Phenanthrene							
	13	2/12/99		ug/L	U	4	20
Phenol							
	13	2/12/99		ug/L	U	4	20
Pyrene							
	13	2/12/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene							
	13	2/12/99		ug/L	U	20	50
Styrene							
	13	2/12/99		ug/L	U	20	50
tert-Butylbenzene							
	13	2/12/99		ug/L	U	20	50
Tetrachloroethene							
	13	2/12/99		ug/L	U	20	50
Toluene							
	13	2/12/99		ug/L	U	20	50
trans-1,2-Dichloroethene							
	13	2/12/99		ug/L	U	20	50
trans-1,3-Dichloropropene							
	13	2/12/99		ug/L	U	20	50
Trichloroethene							
	13	2/12/99		ug/L	U	20	50
Trichlorofluoromethane							
	13	2/12/99		ug/L	U	20	50
Vinyl Chloride							
	13	2/12/99	27	ug/L	J	20	50
Xylenes (Total)							
	13	2/12/99		ug/L	U	20	50

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 24 of 159

CW5-12



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>CW5-13</b>							
1,1,1,2-Tetrachloroethane	13	2/12/99		ug/L	U	20	50
1,1,1-Trichloroethane	13	2/12/99		ug/L	U	20	50
1,1,2,2-Tetrachloroethane	13	2/12/99		ug/L	U	20	50
1,1,2-Trichloroethane	13	2/12/99		ug/L	U	20	50
1,1-Dichloroethane	13	2/12/99		ug/L	U	20	50
1,1-Dichloroethene	13	2/12/99		ug/L	U	20	50
1,1-Dichloropropene	13	2/12/99		ug/L	U	20	50
1,2,3-Trichlorobenzene	13	2/12/99		ug/L	U	20	50
1,2,3-Trichloropropane	13	2/12/99		ug/L	U	20	50
1,2,4-Trichlorobenzene	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
1,2,4-Trimethylbenzene	13	2/12/99		ug/L	U	20	50
1,2-Dibromo-3-chloropropane	13	2/12/99		ug/L	U	20	50
1,2-Dibromoethane	13	2/12/99		ug/L	U	20	50
1,2-Dichlorobenzene	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
1,2-Dichloroethane	13	2/12/99		ug/L	U	20	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	20	50
<b>1,3,5-Trimethylbenzene</b>							
	13	2/12/99		ug/L	U	20	50
<b>1,3-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
<b>1,3-Dichloropropane</b>							
	13	2/12/99		ug/L	U	20	50
<b>1,4-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
<b>2,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	20	50
<b>2,4,5-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	20	100
<b>2,4,6-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dichlorophenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dimethylphenol</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,4-Dinitrophenol</b>							
	13	2/12/99		ug/L	U	20	100
<b>2,4-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	4	20
<b>2,6-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	20	100
<b>2-Butanone</b>							
	13	2/12/99	2500	ug/L		100	500
<b>2-Chloronaphthalene</b>							
	13	2/12/99		ug/L	U	4	20
<b>2-Chlorophenol</b>							
	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U = analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/12/99		ug/L	U	20	50
2-Hexanone	13	2/12/99		ug/L	U	20	100
2-Methylnaphthalene	13	2/12/99		ug/L	U	4	20
2-Methylphenol	13	2/12/99		ug/L	U	4	20
2-Nitroaniline	13	2/12/99		ug/L	U	20	100
2-Nitrophenol	13	2/12/99		ug/L	U	4	20
3,3-Dichlorobenzidine	13	2/12/99		ug/L	U	8	40
3-Nitroaniline	13	2/12/99		ug/L	U	20	100
4,6-Dinitro-2-methylphenol	13	2/12/99		ug/L	U	20	100
4-Bromophenyl-phenylether	13	2/12/99		ug/L	U	4	20
4-Chloro-3-methylphenol	13	2/12/99		ug/L	U	4	20
4-Chloroaniline	13	2/12/99		ug/L	U	4	20
4-Chlorophenyl-phenylether	13	2/12/99		ug/L	U	4	20
4-Chlorotoluene	13	2/12/99		ug/L	U	20	50
4-Isopropyltoluene	13	2/12/99		ug/L	U	20	50
4-Methyl-2-Pentanone	13	2/12/99		ug/L	U	20	100
4-Methylphenol	13	2/12/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/12/99		ug/L	U	20	100
4-Nitrophenol	13	2/12/99		ug/L	U	20	100
Acenaphthene	13	2/12/99		ug/L	U	4	20
Acenaphthylene	13	2/12/99		ug/L	U	4	20
Acetone	13	2/12/99	890	ug/L		20	100
Acrylonitrile	13	2/12/99		ug/L	U	20	100
Anthracene	13	2/12/99		ug/L	U	4	20
Azobenzene	13	2/12/99		ug/L	U	20	100
Benzene	13	2/12/99		ug/L	U	20	50
Benzo(a)anthracene	13	2/12/99		ug/L	U	4	20
Benzo(a)pyrene	13	2/12/99		ug/L	U	4	20
Benzo(b)fluoranthene	13	2/12/99		ug/L	U	4	20
Benzo(g,h,i)perylene	13	2/12/99		ug/L	U	4	20
Benzo(k)fluoranthene	13	2/12/99		ug/L	U	4	20
Benzoic Acid	13	2/12/99		ug/L	U	20	100
Benzyl Alcohol	13	2/12/99		ug/L	U	4	20
Bis(2-chloroethoxy)methane	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 26 of 159

CWS-13

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/12/99		ug/L	U	4	20
bis(2-Chloroisopropyl) Ether	13	2/12/99		ug/L	U	4	20
bis(2-ethylhexyl)phthalate	13	2/12/99		ug/L	U	4	20
Bromobenzene	13	2/12/99		ug/L	U	20	50
Bromochloromethane	13	2/12/99		ug/L	U	20	50
Bromodichloromethane	13	2/12/99		ug/L	U	20	50
Bromoform	13	2/12/99		ug/L	U	20	50
Bromomethane	13	2/12/99		ug/L	U	20	100
Butylbenzylphthalate	13	2/12/99		ug/L	U	4	20
Carbon Disulfide	13	2/12/99		ug/L	U	20	50
Carbon Tetrachloride	13	2/12/99		ug/L	U	20	50
Chlorobenzene	13	2/12/99		ug/L	U	20	50
Chloroethane	13	2/12/99		ug/L	U	20	100
Chloroform	13	2/12/99	250	ug/L		20	50
Chloromethane	13	2/12/99		ug/L	U	20	100
Chrysene	13	2/12/99		ug/L	U	4	20
cis-1,2-Dichloroethene	13	2/12/99		ug/L	U	20	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/12/99		ug/L	U	20	50
Dibenzo(a,h)anthracene	13	2/12/99		ug/L	U	4	20
Dibenzofuran	13	2/12/99		ug/L	U	4	20
Dibromochloromethane	13	2/12/99		ug/L	U	20	50
Dibromomethane	13	2/12/99		ug/L	U	20	50
Dichlorodifluoromethane	13	2/12/99		ug/L	U	20	50
Diethylphthalate	13	2/12/99		ug/L	U	4	20
Dimethyl phthalate	13	2/12/99		ug/L	U	4	20
Di-n-butylphthalate	13	2/12/99		ug/L	U	4	20
di-n-octyl phthalate	13	2/12/99		ug/L	U	4	20
Ethylbenzene	13	2/12/99		ug/L	U	20	50
Fluoranthene	13	2/12/99		ug/L	U	4	20
Fluorene	13	2/12/99		ug/L	U	4	20
Hexachlorobenzene	13	2/12/99		ug/L	U	4	20
Hexachlorobutadiene	13	2/12/99		ug/L	U	20	50
	13	2/12/99		ug/L	U	4	20
Hexachlorocyclopentadiene	13	2/12/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/12/99		ug/L	U	4	20
Indeno(1,2,3-cd)pyrene	13	2/12/99		ug/L	U	4	20
Isophorone	13	2/12/99		ug/L	U	4	20
Isopropylbenzene	13	2/12/99		ug/L	U	20	50
Methylene Chloride	13	2/12/99		ug/L	U	20	50
Naphthalene	13	2/12/99		ug/L	U	4	20
	13	2/12/99		ug/L	U	20	50
n-Butylbenzene	13	2/12/99		ug/L	U	20	50
Nitrobenzene	13	2/12/99		ug/L	U	4	20
n-Nitrosodimethylamine	13	2/12/99		ug/L	U	4	20
n-Nitroso-di-n-propylamine	13	2/12/99		ug/L	U	4	20
n-Nitrosodiphenylamine	13	2/12/99		ug/L	U	4	20
n-Propylbenzene	13	2/12/99		ug/L	U	20	50
Pentachlorophenol	13	2/12/99		ug/L	U	20	100
Phenanthrene	13	2/12/99		ug/L	U	4	20
Phenol	13	2/12/99		ug/L	U	4	20
Pyrene	13	2/12/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/12/99		ug/L	U	20	50
Styrene	13	2/12/99		ug/L	U	20	50
tert-Butylbenzene	13	2/12/99		ug/L	U	20	50
Tetrachloroethene	13	2/12/99		ug/L	U	20	50
Toluene	13	2/12/99		ug/L	U	20	50
trans-1,2-Dichloroethene	13	2/12/99		ug/L	U	20	50
trans-1,3-Dichloropropene	13	2/12/99		ug/L	U	20	50
Trichloroethene	13	2/12/99		ug/L	U	20	50
Trichlorofluoromethane	13	2/12/99		ug/L	U	20	50
Vinyl Chloride	13	2/12/99		ug/L	U	20	100
Xylenes (Total)	13	2/12/99		ug/L	U	20	50

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 28 of 159

CW5-13

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>MW5-1</b>							
1,1,1,2-Tetrachloroethane	13	2/12/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/12/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/12/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/12/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/12/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/12/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/12/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/12/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/12/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/12/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/12/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/12/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
1,2-Dichloroethane	13	2/12/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	13	2/12/99		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
<b>1,3-Dichloropropane</b>							
	13	2/12/99		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
<b>2,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	13	2/12/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	13	2/12/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	13	2/12/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	10	50
<b>2-Butanone</b>							
	13	2/12/99		ug/L	U	2	10
<b>2-Chloronaphthalene</b>							
	13	2/12/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	13	2/12/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U = analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/12/99		ug/L	U	2	5
2-Hexanone	13	2/12/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/12/99		ug/L	U	2	10
2-Methylphenol	13	2/12/99		ug/L	U	2	10
2-Nitroaniline	13	2/12/99		ug/L	U	10	50
2-Nitrophenol	13	2/12/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/12/99		ug/L	U	4	20
3-Nitroaniline	13	2/12/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/12/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/12/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/12/99		ug/L	U	2	10
4-Chloroaniline	13	2/12/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/12/99		ug/L	U	2	10
4-Chlorotoluene	13	2/12/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/12/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/12/99		ug/L	U	2	10
4-Methylphenol	13	2/12/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/12/99		ug/L	U	10	50
4-Nitrophenol	13	2/12/99		ug/L	U	10	50
Acenaphthene	13	2/12/99		ug/L	U	2	10
Acenaphthylene	13	2/12/99	23	ug/L		2	10
Acetone	13	2/12/99		ug/L	U	2	10
Acrylonitrile	13	2/12/99		ug/L	U	2	10
Anthracene	13	2/12/99		ug/L	U	2	10
Azobenzene	13	2/12/99		ug/L	U	10	50
Benzene	13	2/12/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/12/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/12/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/12/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/12/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/12/99		ug/L	U	2	10
Benzoic Acid	13	2/12/99		ug/L	U	10	50
Benzyl Alcohol	13	2/12/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/12/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 30 of 159

MW5-1

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/12/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/12/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/12/99		ug/L	U	2	10
Bromobenzene	13	2/12/99		ug/L	U	2	5
Bromochloromethane	13	2/12/99		ug/L	U	2	5
Bromodichloromethane	13	2/12/99		ug/L	U	2	5
Bromoform	13	2/12/99		ug/L	U	2	5
Bromomethane	13	2/12/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/12/99		ug/L	U	2	10
Carbon Disulfide	13	2/12/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/12/99		ug/L	U	2	5
Chlorobenzene	13	2/12/99		ug/L	U	2	5
Chloroethane	13	2/12/99		ug/L	U	2	10
Chloroform	13	2/12/99		ug/L	U	2	5
Chloromethane	13	2/12/99		ug/L	U	2	10
Chrysene	13	2/12/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/12/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/12/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/12/99		ug/L	U	2	10
Dibenzofuran	13	2/12/99		ug/L	U	2	10
Dibromochloromethane	13	2/12/99		ug/L	U	2	5
Dibromomethane	13	2/12/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/12/99		ug/L	U	2	5
Diethylphthalate	13	2/12/99		ug/L	U	2	10
Dimethyl phthalate	13	2/12/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/12/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/12/99		ug/L	U	2	10
Ethylbenzene	13	2/12/99		ug/L	U	2	5
Fluoranthene	13	2/12/99		ug/L	U	2	10
Fluorene	13	2/12/99		ug/L	U	2	10
Hexachlorobenzene	13	2/12/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/12/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/12/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/12/99		ug/L	U	2	10
Isophorone	13	2/12/99		ug/L	U	2	10
Isopropylbenzene	13	2/12/99		ug/L	U	2	5
Methylene Chloride	13	2/12/99		ug/L	U	2	5
Naphthalene	13	2/12/99		ug/L	U	2	10
	13	2/12/99		ug/L	U	2	5
n-Butylbenzene	13	2/12/99		ug/L	U	2	5
Nitrobenzene	13	2/12/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/12/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/12/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/12/99		ug/L	U	2	10
n-Propylbenzene	13	2/12/99		ug/L	U	2	5
Pentachlorophenol	13	2/12/99		ug/L	U	10	50
Phenanthrene	13	2/12/99		ug/L	U	2	10
Phenol	13	2/12/99		ug/L	U	2	10
Pyrene	13	2/12/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/12/99		ug/L	U	2	5
Styrene	13	2/12/99		ug/L	U	2	5
tert-Butylbenzene	13	2/12/99		ug/L	U	2	5
Tetrachloroethene	13	2/12/99		ug/L	U	2	5
Toluene	13	2/12/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/12/99		ug/L	U	2	5
trans-1,3-Dichloropropene	13	2/12/99		ug/L	U	2	5
Trichloroethene	13	2/12/99	2.5	ug/L	J	2	5
Trichlorofluoromethane	13	2/12/99		ug/L	U	2	5
Vinyl Chloride	13	2/12/99		ug/L	U	2	10
Xylenes (Total)	13	2/12/99		ug/L	U	2	5

**Volatile Organics**

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J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 32 of 159

MW5-1



## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>MW5-6</b>							
1,1,1,2-Tetrachloroethane	13	2/12/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/12/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/12/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/12/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/12/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/12/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/12/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/12/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/12/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/12/99		ug/L	U	2	10
	13	2/12/99		ug/L	U	2	5
1,2,4-Trimethylbenzene	13	2/12/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/12/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/12/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
1,2-Dichloroethane	13	2/12/99		ug/L	U	2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	13	2/12/99		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	2	10
	13	2/12/99		ug/L	U	2	5
<b>1,3-Dichloropropane</b>							
	13	2/12/99		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	13	2/12/99		ug/L	U	2	5
	13	2/12/99		ug/L	U	2	10
<b>2,2-Dichloropropane</b>							
	13	2/12/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	13	2/12/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	13	2/12/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	13	2/12/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	13	2/12/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	13	2/12/99		ug/L	U	10	50
<b>2-Butanone</b>							
	13	2/12/99	11	ug/L		2	10
<b>2-Chloronaphthalene</b>							
	13	2/12/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	13	2/12/99		ug/L	U	2	10

## Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

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MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/12/99		ug/L	U	2	5
2-Hexanone	13	2/12/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/12/99		ug/L	U	2	10
2-Methylphenol	13	2/12/99		ug/L	U	2	10
2-Nitroaniline	13	2/12/99		ug/L	U	10	50
2-Nitrophenol	13	2/12/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/12/99		ug/L	U	4	20
3-Nitroaniline	13	2/12/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/12/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/12/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/12/99		ug/L	U	2	10
4-Chloroaniline	13	2/12/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/12/99		ug/L	U	2	10
4-Chlorotoluene	13	2/12/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/12/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/12/99		ug/L	U	2	10
4-Methylphenol	13	2/12/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/12/99		ug/L	U	10	50
4-Nitrophenol	13	2/12/99		ug/L	U	10	50
Acenaphthene	13	2/12/99		ug/L	U	2	10
Acenaphthylene	13	2/12/99		ug/L	U	2	10
Acetone	13	2/12/99	7.1	ug/L	J	2	10
Acrylonitrile	13	2/12/99		ug/L	U	2	10
Anthracene	13	2/12/99		ug/L	U	2	10
Azobenzene	13	2/12/99		ug/L	U	10	50
Benzene	13	2/12/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/12/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/12/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/12/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/12/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/12/99		ug/L	U	2	10
Benzoic Acid	13	2/12/99		ug/L	U	10	50
Benzyl Alcohol	13	2/12/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/12/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 34 of 159

MW5-6

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/12/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/12/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/12/99		ug/L	U	2	10
Bromobenzene	13	2/12/99		ug/L	U	2	5
Bromochloromethane	13	2/12/99		ug/L	U	2	5
Bromodichloromethane	13	2/12/99		ug/L	U	2	5
Bromoform	13	2/12/99		ug/L	U	2	5
Bromomethane	13	2/12/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/12/99		ug/L	U	2	10
Carbon Disulfide	13	2/12/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/12/99		ug/L	U	2	5
Chlorobenzene	13	2/12/99		ug/L	U	2	5
Chloroethane	13	2/12/99		ug/L	U	2	10
Chloroform	13	2/12/99		ug/L	U	2	5
Chloromethane	13	2/12/99		ug/L	U	2	10
Chrysene	13	2/12/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/12/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/12/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/12/99		ug/L	U	2	10
Dibenzofuran	13	2/12/99		ug/L	U	2	10
Dibromochloromethane	13	2/12/99		ug/L	U	2	5
Dibromomethane	13	2/12/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/12/99		ug/L	U	2	5
Diethylphthalate	13	2/12/99		ug/L	U	2	10
Dimethyl phthalate	13	2/12/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/12/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/12/99		ug/L	U	2	10
Ethylbenzene	13	2/12/99		ug/L	U	2	5
Fluoranthene	13	2/12/99		ug/L	U	2	10
Fluorene	13	2/12/99		ug/L	U	2	10
Hexachlorobenzene	13	2/12/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/12/99		ug/L	U	2	10
	13	2/12/99		ug/L	U	2	5
Hexachlorocyclopentadiene	13	2/12/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U = analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 35 of 159

MW5-6

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/12/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/12/99		ug/L	U	2	10
Isophorone	13	2/12/99		ug/L	U	2	10
Isopropylbenzene	13	2/12/99		ug/L	U	2	5
Methylene Chloride	13	2/12/99		ug/L	U	2	5
Naphthalene	13	2/12/99		ug/L	U	2	10
	13	2/12/99		ug/L	U	2	5
n-Butylbenzene	13	2/12/99		ug/L	U	2	5
Nitrobenzene	13	2/12/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/12/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/12/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/12/99		ug/L	U	2	10
n-Propylbenzene	13	2/12/99		ug/L	U	2	5
Pentachlorophenol	13	2/12/99		ug/L	U	10	50
Phenanthrene	13	2/12/99		ug/L	U	2	10
Phenol	13	2/12/99		ug/L	U	2	10
Pyrene	13	2/12/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/12/99		ug/L	U	2	5
Styrene	13	2/12/99		ug/L	U	2	5
tert-Butylbenzene	13	2/12/99		ug/L	U	2	5
Tetrachloroethene	13	2/12/99		ug/L	U	2	5
Toluene	13	2/12/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/12/99		ug/L	U	2	5
trans-1,3-Dichloropropene	13	2/12/99		ug/L	U	2	5
Trichloroethene	13	2/12/99		ug/L	U	2	5
Trichlorofluoromethane	13	2/12/99		ug/L	U	2	5
Vinyl Chloride	13	2/12/99		ug/L	U	2	10
Xylenes (Total)	13	2/12/99		ug/L	U	2	5

**Volatile Organics**

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J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 36 of 159

MW5-6

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-08</b>							
<b>1,1,1,2-Tetrachloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,1,1-Trichloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,1,2,2-Tetrachloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,1,2-Trichloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,1-Dichloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,1-Dichloroethene</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,1-Dichloropropene</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,2,3-Trichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,2,3-Trichloropropane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,2,4-Trichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2,4-Trimethylbenzene</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,2-Dibromo-3-chloropropane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,2-Dibromoethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,2-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	10
<b>1,2-Dichloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,2-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,3,5-Trimethylbenzene</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
<b>1,3-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	10
<b>1,3-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5

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<b>1,4-Dichlorobenzene</b>							
	01	3/12/98		ug/L	U	2	10
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	10
<b>2,2-Dichloropropane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
<b>2-Butanone</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>2-Chloronaphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>2-Chlorotoluene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>2-Hexanone</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>2-Methylnaphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>2-Methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>2-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
<b>2-Nitrophenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>3,3-Dichlorobenzidine</b>							
	01	3/12/98		ug/L	U	4	20
	09	9/8/98		ug/L	U	4	20
<b>3-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
<b>4,4-DDD</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>4,4-DDE</b>							
	01	3/12/98		ug/L	U	0.1	0.1

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<b>4,4-DDT</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>4,6-Dinitro-2-methylphenol</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
<b>4-Bromophenyl-phenylether</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>4-Chloro-3-methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>4-Chloroaniline</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>4-Chlorophenyl-phenylether</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>4-Chlorotoluene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>4-Isopropyltoluene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>4-Methyl-2-Pentanone</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>4-Methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>4-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>4-Nitrophenol</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
<b>Acenaphthene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Acenaphthylene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Acetone</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98	8.4	ug/L	J	2	10
<b>Acrolein</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Acrylonitrile</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Aldrin</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Alpha-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Azobenzene</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
<b>Benzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Benzo(a)anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10

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<b>Benzo(a)pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Benzo(b)fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Benzo(g,h,i)perylene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Benzo(k)fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Benzoic Acid</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
<b>Benzyl Alcohol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Beta-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Bis(2-chloroethoxy)methane</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>bis(2-Chloroethyl) Ether</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>bis(2-Chloroisopropyl) Ether</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>bis(2-ethylhexyl)phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Bromobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Bromochloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Bromodichloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98	59	ug/L		2	5
<b>Bromoform</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Bromomethane</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Butylbenzylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Carbon Disulfide</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98	2.3	ug/L	J	2	5
<b>Carbon Tetrachloride</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Chlordane</b>							
	01	3/12/98		ug/L	U	0.5	0.5
<b>Chlorobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Chloroethane</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10

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<b>Chloroform</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98	720	ug/L		20	50
<b>Chloromethane</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Chrysene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>cis-1,2-Dichloroethene</b>							
	01	3/12/98	190	ug/L		2	5
	09	9/8/98	110	ug/L		2	5
<b>cis-1,3-Dichloropropene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Delta-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Dibenzo(a,h)anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Dibenzofuran</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Dibromochloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Dibromomethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Dichlorodifluoromethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Dieldrin</b>							
	01	3/12/98		ug/L	U	0.1	0.1

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Diethylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Dimethyl phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Di-n-butylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>di-n-octyl phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Endosulfan I</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Endosulfan II</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endosulfan Sulfate</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin Aldehyde</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin Ketone</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Ethylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Fluorene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10

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<b>Gamma-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Heptachlor</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Heptachlor Epoxide</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Hexachlorobenzene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Hexachlorobutadiene</b>							
	01	3/12/98		ug/L	U	2	10
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	5
<b>Hexachlorocyclopentadiene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Hexachloroethane</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Isophorone</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Isopropylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Methoxychlor</b>							
	01	3/12/98		ug/L	U	0.5	0.5
<b>Methylene Chloride</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98	12	ug/L		2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Naphthalene</b>							
	01	3/12/98		ug/L	U	2	5
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	10
<b>n-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Nitrobenzene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>n-Nitrosodimethylamine</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>n-Nitroso-di-n-propylamine</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>n-Nitrosodiphenylamine</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>n-Propylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Pentachlorophenol</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
<b>Phenanthrene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Phenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>sec-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Styrene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>tert-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Tetrachloroethene</b>							
	01	3/12/98	1700	ug/L		2	5
	09	9/8/98	2000	ug/L		20	50
<b>Toluene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Toxaphene</b>							
	01	3/12/98		ug/L	U	1	1
<b>trans-1,2-Dichloroethene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98	2.3	ug/L	J	2	5
<b>trans-1,3-Dichloropropene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
<b>Trichloroethene</b>							
	01	3/12/98	120	ug/L		2	5
	09	9/8/98	230	ug/L		20	50
<b>Trichlorofluoromethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Vinyl Acetate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Vinyl Chloride</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98	2	ug/L	J	2	10
<b>Xylenes (Total)</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5

**Volatile Organics**

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B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-1</b>							
1,1,1,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/10/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/10/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/10/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/10/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/10/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,2-Dichloroethane	13	2/10/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
<b>1,3-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
<b>2,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	10	50
<b>2-Butanone</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chloronaphthalene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

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PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 44 of 159

**PW5-1**

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/10/99		ug/L	U	2	5
2-Hexanone	13	2/10/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/10/99		ug/L	U	2	10
2-Methylphenol	13	2/10/99		ug/L	U	2	10
2-Nitroaniline	13	2/10/99		ug/L	U	10	50
2-Nitrophenol	13	2/10/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/10/99		ug/L	U	4	20
3-Nitroaniline	13	2/10/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/10/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/10/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/10/99		ug/L	U	2	10
4-Chloroaniline	13	2/10/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/10/99		ug/L	U	2	10
4-Chlorotoluene	13	2/10/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/10/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/10/99		ug/L	U	2	10
4-Methylphenol	13	2/10/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/10/99		ug/L	U	10	50
4-Nitrophenol	13	2/10/99		ug/L	U	10	50
Acenaphthene	13	2/10/99		ug/L	U	2	10
Acenaphthylene	13	2/10/99		ug/L	U	2	10
Acetone	13	2/10/99		ug/L	U	2	10
Acrylonitrile	13	2/10/99		ug/L	U	2	10
Anthracene	13	2/10/99		ug/L	U	2	10
Azobenzene	13	2/10/99		ug/L	U	10	50
Benzene	13	2/10/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/10/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/10/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/10/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/10/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/10/99		ug/L	U	2	10
Benzoic Acid	13	2/10/99		ug/L	U	10	50
Benzyl Alcohol	13	2/10/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/10/99		ug/L	U	2	10

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If no value is listed under results, analyte was not detected at or above the MDL

Page 45 of 159

PW5-1

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/10/99		ug/L	U	2	10
Bromobenzene	13	2/10/99		ug/L	U	2	5
Bromochloromethane	13	2/10/99		ug/L	U	2	5
Bromodichloromethane	13	2/10/99		ug/L	U	2	5
Bromoform	13	2/10/99		ug/L	U	2	5
Bromomethane	13	2/10/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/10/99		ug/L	U	2	10
Carbon Disulfide	13	2/10/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/10/99		ug/L	U	2	5
Chlorobenzene	13	2/10/99		ug/L	U	2	5
Chloroethane	13	2/10/99		ug/L	U	2	10
Chloroform	13	2/10/99		ug/L	U	2	5
Chloromethane	13	2/10/99		ug/L	U	2	10
Chrysene	13	2/10/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/10/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/10/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/10/99		ug/L	U	2	10
Dibenzofuran	13	2/10/99		ug/L	U	2	10
Dibromochloromethane	13	2/10/99		ug/L	U	2	5
Dibromomethane	13	2/10/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/10/99		ug/L	U	2	5
Diethylphthalate	13	2/10/99		ug/L	U	2	10
Dimethyl phthalate	13	2/10/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/10/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/10/99		ug/L	U	2	10
Ethylbenzene	13	2/10/99		ug/L	U	2	5
Fluoranthene	13	2/10/99		ug/L	U	2	10
Fluorene	13	2/10/99		ug/L	U	2	10
Hexachlorobenzene	13	2/10/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
Hexachlorocyclopentadiene	13	2/10/99		ug/L	U	2	10

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Page 46 of 159

PW5-1

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/10/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/10/99		ug/L	U	2	10
Isophorone	13	2/10/99		ug/L	U	2	10
Isopropylbenzene	13	2/10/99		ug/L	U	2	5
Methylene Chloride	13	2/10/99		ug/L	U	2	5
Naphthalene	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
n-Butylbenzene	13	2/10/99		ug/L	U	2	5
Nitrobenzene	13	2/10/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/10/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/10/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/10/99		ug/L	U	2	10
n-Propylbenzene	13	2/10/99		ug/L	U	2	5
Pentachlorophenol	13	2/10/99		ug/L	U	10	50
Phenanthrene	13	2/10/99		ug/L	U	2	10
Phenol	13	2/10/99		ug/L	U	2	10
Pyrene	13	2/10/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/10/99		ug/L	U	2	5
Styrene	13	2/10/99		ug/L	U	2	5
tert-Butylbenzene	13	2/10/99		ug/L	U	2	5
Tetrachloroethene	13	2/10/99		ug/L	U	2	5
Toluene	13	2/10/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/10/99		ug/L	U	2	5
trans-1,3-Dichloropropene	13	2/10/99		ug/L	U	2	5
Trichloroethene	13	2/10/99		ug/L	U	2	5
Trichlorofluoromethane	13	2/10/99		ug/L	U	2	5
Vinyl Chloride	13	2/10/99		ug/L	U	2	10
Xylenes (Total)	13	2/10/99		ug/L	U	2	5

**Volatile Organics****Qualifiers = (Based on EPA CLP 3/90)**

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## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-10</b>							
<b>1,1,1,2-Tetrachloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1,1-Trichloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1,2,2-Tetrachloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1,2-Trichloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1-Dichloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1-Dichloroethene</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1-Dichloropropene</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2,3-Trichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2,3-Trichloropropane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2,4-Trichlorobenzene</b>							
01	3/12/98		ug/L	U		2	10
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
<b>1,2,4-Trimethylbenzene</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2-Dibromo-3-chloropropane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2-Dibromoethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
<b>1,2-Dichloroethane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5

## Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

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MDL = Method Detection Limit

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J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 48 of 159

PW5-10



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,3,5-Trimethylbenzene</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,3-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
<b>1,3-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,4-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	10
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
<b>2,2-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>2,4,5-Trichlorophenol</b>							
01	3/12/98		ug/L	U		10	50
09	9/8/98		ug/L	U		10	50
13	2/11/99		ug/L	U		10	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>2,4,6-Trichlorophenol</b>							
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	10
<b>2,4-Dichlorophenol</b>							
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	10
<b>2,4-Dimethylphenol</b>							
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	10
<b>2,4-Dinitrophenol</b>							
01	3/12/98		ug/L	U		10	50
09	9/8/98		ug/L	U		10	50
13	2/11/99		ug/L	U		10	50
<b>2,4-Dinitrotoluene</b>							
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	10
<b>2,6-Dinitrotoluene</b>							
01	3/12/98		ug/L	U		10	50
09	9/8/98		ug/L	U		10	50
13	2/11/99		ug/L	U		10	50
<b>2-Butanone</b>							
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	10
<b>2-Chloronaphthalene</b>							
01	3/12/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	10

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Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>2-Chlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2-Chlorotoluene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>2-Hexanone</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2-Methylnaphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2-Methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>2-Nitrophenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>3,3-Dichlorobenzidine</b>							
	01	3/12/98		ug/L	U	4	20
	09	9/8/98		ug/L	U	4	20
	13	2/11/99		ug/L	U	4	20

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>3-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>4,4-DDD</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>4,4-DDE</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>4,4-DDT</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>4,6-Dinitro-2-methylphenol</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>4-Bromophenyl-phenylether</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Chloro-3-methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Chloroaniline</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Chlorophenyl-phenylether</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Chlorotoluene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5

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Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>4-Isopropyltoluene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>4-Methyl-2-Pentanone</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>4-Nitrophenol</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>Acenaphthene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Acenaphthylene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Acetone</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

## Well ID:

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<b>Acrolein</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Acrylonitrile</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Aldrin</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Alpha-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Azobenzene</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>Benzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Benzo(a)anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Benzo(a)pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

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<b>Benzo(b)fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Benzo(g,h,i)perylene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Benzo(k)fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Benzoic Acid</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>Benzyl Alcohol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Beta-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Bis(2-chloroethoxy)methane</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>bis(2-Chloroethyl) Ether</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>bis(2-Chloroisopropyl) Ether</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>bis(2-ethylhexyl)phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Bromobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Bromochloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Bromodichloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Bromoform</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Bromomethane</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Butylbenzylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Carbon Disulfide</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98	3.2	ug/L	J	2	5
	13	2/11/99		ug/L	U	2	5

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<b>Carbon Tetrachloride</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Chlordane</b>							
	01	3/12/98		ug/L	U	0.5	0.5
<b>Chlorobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Chloroethane</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Chloroform</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Chloromethane</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Chrysene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>cis-1,2-Dichloroethene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>cis-1,3-Dichloropropene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Delta-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Dibenzo(a,h)anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Dibenzofuran</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Dibromochloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Dibromomethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Dichlorodifluoromethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Dieldrin</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Diethylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Dimethyl phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

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Page 53 of 159

PW5-10

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Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Di-n-butylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>di-n-octyl phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Endosulfan I</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Endosulfan II</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endosulfan Sulfate</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin Aldehyde</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin Ketone</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Ethylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Fluorene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Gamma-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05

**Well ID:**

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<b>Heptachlor</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Heptachlor Epoxide</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Hexachlorobenzene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Hexachlorobutadiene</b>							
	01	3/12/98		ug/L	U	2	10
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	10
<b>Hexachlorocyclopentadiene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Hexachloroethane</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Isophorone</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

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<b>Isopropylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Methoxychlor</b>							
	01	3/12/98		ug/L	U	0.5	0.5
<b>Methylene Chloride</b>							
	01	3/12/98	17	ug/L	B	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Naphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	10
<b>n-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Nitrobenzene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>n-Nitrosodimethylamine</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>n-Nitroso-di-n-propylamine</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>n-Nitrosodiphenylamine</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>n-Propylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Pentachlorophenol</b>							
	01	3/12/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>Phenanthrene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Phenol</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>sec-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Styrene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5

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<b>tert-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Tetrachloroethene</b>							
	01	3/12/98	2.6	ug/L	J	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Toluene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Toxaphene</b>							
	01	3/12/98		ug/L	U	1	1
<b>trans-1,2-Dichloroethene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>trans-1,3-Dichloropropene</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Trichloroethene</b>							
	01	3/12/98	4.8	ug/L	J	2	5
	09	9/8/98	3.1	ug/L	J	2	5
	13	2/11/99	3.3	ug/L	J	2	5
<b>Trichlorofluoromethane</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Vinyl Acetate</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Vinyl Chloride</b>							
	01	3/12/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Xylenes (Total)</b>							
	01	3/12/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5

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## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-11</b>							
<b>1,1,1,2-Tetrachloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1,1-Trichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1,2,2-Tetrachloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1,2-Trichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1-Dichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1-Dichloroethene</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,1-Dichloropropene</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2,3-Trichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2,3-Trichloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2,4-Trichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
01	3/12/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2,4-Trimethylbenzene</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2-Dibromo-3-chloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2-Dibromoethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
01	3/12/98		ug/L	U		2	10
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
<b>1,2-Dichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,2-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,3,5-Trimethylbenzene</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
<b>1,3-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	10
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
<b>1,3-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/11/99		ug/L	U		2	5

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<b>1,4-Dichlorobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	5
<b>2,2-Dichloropropane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>2-Butanone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>2-Chloronaphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2-Chlorotoluene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>2-Hexanone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2-Methylnaphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2-Methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>2-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>2-Nitrophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>3,3-Dichlorobenzidine</b>							
	01	3/12/98		ug/L	U	4	20
	13	2/11/99		ug/L	U	4	20
<b>3-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>4,4-DDD</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>4,4-DDE</b>							
	01	3/12/98		ug/L	U	0.1	0.1

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<b>4,4-DDT</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>4,6-Dinitro-2-methylphenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>4-Bromophenyl-phenylether</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Chloro-3-methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Chloroaniline</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Chlorophenyl-phenylether</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Chlorotoluene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>4-Isopropyltoluene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>4-Methyl-2-Pentanone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>4-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>4-Nitrophenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>Acenaphthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Acenaphthylene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Acetone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99	6.7	ug/L	J	2	10
<b>Acrolein</b>							
	01	3/12/98		ug/L	U	2	10
<b>Acrylonitrile</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Aldrin</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Alpha-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Azobenzene</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>Benzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Benzo(a)anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

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<b>Benzo(a)pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Benzo(b)fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Benzo(g,h,i)perylene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Benzo(k)fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Benzoic Acid</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>Benzyl Alcohol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Beta-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Bis(2-chloroethoxy)methane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>bis(2-Chloroethyl) Ether</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>bis(2-Chloroisopropyl) Ether</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>bis(2-ethylhexyl)phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Bromobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Bromochloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Bromodichloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Bromoform</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Bromomethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Butylbenzylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Carbon Disulfide</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Carbon Tetrachloride</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Chlordane</b>							
	01	3/12/98		ug/L	U	0.5	0.5
<b>Chlorobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Chloroethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

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<b>Chloroform</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Chloromethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Chrysene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>cis-1,2-Dichloroethene</b>							
	01	3/12/98	4.3	ug/L	J	2	5
	13	2/11/99		ug/L	U	2	5
<b>cis-1,3-Dichloropropene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Delta-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Dibenzo(a,h)anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Dibenzofuran</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Dibromochloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Dibromomethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Dichlorodifluoromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Dieldrin</b>							
	01	3/12/98		ug/L	U	0.1	0.1

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Diethylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Dimethyl phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Di-n-butylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>di-n-octyl phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Endosulfan I</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Endosulfan II</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endosulfan Sulfate</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin Aldehyde</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin Ketone</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Ethylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Fluorene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

**Volatile Organics****Qualifiers = (Based on EPA CLP 3/90)**

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MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Gamma-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Heptachlor</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Heptachlor Epoxide</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Hexachlorobenzene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Hexachlorobutadiene</b>							
	01	3/12/98		ug/L	U	2	5
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	5
<b>Hexachlorocyclopentadiene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Hexachloroethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Isophorone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Isopropylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Methoxychlor</b>							
	01	3/12/98		ug/L	U	0.5	0.5
<b>Methylene Chloride</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Naphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	10
<b>n-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Nitrobenzene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>n-Nitrosodimethylamine</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>n-Nitroso-di-n-propylamine</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>n-Nitrosodiphenylamine</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>n-Propylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Pentachlorophenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/11/99		ug/L	U	10	50
<b>Phenanthrene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>Phenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10

**Volatile Organics**

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Page 62 of 159

PW5-11

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
<b>sec-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Styrene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>tert-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Tetrachloroethene</b>							
	01	3/12/98	110	ug/L		2	5
	13	2/11/99	6	ug/L		2	5
<b>Toluene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Toxaphene</b>							
	01	3/12/98		ug/L	U	1	1
<b>trans-1,2-Dichloroethene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99	4.2	ug/L	J	2	5
<b>trans-1,3-Dichloropropene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Trichloroethene</b>							
	01	3/12/98	22	ug/L		2	5
	13	2/11/99	2.6	ug/L	J	2	5
<b>Trichlorofluoromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5
<b>Vinyl Acetate</b>							
	01	3/12/98		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Vinyl Chloride</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/11/99	24	ug/L		2	10
<b>Xylenes (Total)</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	5

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## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-12</b>							
1,1,1,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/10/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/10/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/10/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/10/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/10/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,2-Dichloroethane	13	2/10/99		ug/L	U	2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
<b>1,3-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
<b>2,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	10	50
<b>2-Butanone</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chloronaphthalene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	13	2/10/99		ug/L	U	2	10

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Page 64 of 159

PW5-12



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene							
13	2/10/99		ug/L	U		2	5
2-Hexanone							
13	2/10/99		ug/L	U		2	10
2-Methylnaphthalene							
13	2/10/99		ug/L	U		2	10
2-Methylphenol							
13	2/10/99		ug/L	U		2	10
2-Nitroaniline							
13	2/10/99		ug/L	U		10	50
2-Nitrophenol							
13	2/10/99		ug/L	U		2	10
3,3-Dichlorobenzidine							
13	2/10/99		ug/L	U		4	20
3-Nitroaniline							
13	2/10/99		ug/L	U		10	50
4,6-Dinitro-2-methylphenol							
13	2/10/99		ug/L	U		10	50
4-Bromophenyl-phenylether							
13	2/10/99		ug/L	U		2	10
4-Chloro-3-methylphenol							
13	2/10/99		ug/L	U		2	10
4-Chloroaniline							
13	2/10/99		ug/L	U		2	10
4-Chlorophenyl-phenylether							
13	2/10/99		ug/L	U		2	10
4-Chlorotoluene							
13	2/10/99		ug/L	U		2	5
4-Isopropyltoluene							
13	2/10/99		ug/L	U		2	5
4-Methyl-2-Pentanone							
13	2/10/99		ug/L	U		2	10
4-Methylphenol							
13	2/10/99		ug/L	U		2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline							
13	2/10/99		ug/L	U		10	50
4-Nitrophenol							
13	2/10/99		ug/L	U		10	50
Acenaphthene							
13	2/10/99		ug/L	U		2	10
Acenaphthylene							
13	2/10/99		ug/L	U		2	10
Acetone							
13	2/10/99		ug/L	U		2	10
Acrylonitrile							
13	2/10/99		ug/L	U		2	10
Anthracene							
13	2/10/99		ug/L	U		2	10
Azobenzene							
13	2/10/99		ug/L	U		10	50
Benzene							
13	2/10/99		ug/L	U		2	5
Benzo(a)anthracene							
13	2/10/99		ug/L	U		2	10
Benzo(a)pyrene							
13	2/10/99		ug/L	U		2	10
Benzo(b)fluoranthene							
13	2/10/99		ug/L	U		2	10
Benzo(g,h,i)perylene							
13	2/10/99		ug/L	U		2	10
Benzo(k)fluoranthene							
13	2/10/99		ug/L	U		2	10
Benzoic Acid							
13	2/10/99		ug/L	U		10	50
Benzyl Alcohol							
13	2/10/99		ug/L	U		2	10
Bis(2-chloroethoxy)methane							
13	2/10/99		ug/L	U		2	10

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/10/99		ug/L	U	2	10
Bromobenzene	13	2/10/99		ug/L	U	2	5
Bromochloromethane	13	2/10/99		ug/L	U	2	5
Bromodichloromethane	13	2/10/99		ug/L	U	2	5
Bromoform	13	2/10/99		ug/L	U	2	5
Bromomethane	13	2/10/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/10/99		ug/L	U	2	10
Carbon Disulfide	13	2/10/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/10/99		ug/L	U	2	5
Chlorobenzene	13	2/10/99		ug/L	U	2	5
Chloroethane	13	2/10/99		ug/L	U	2	10
Chloroform	13	2/10/99		ug/L	U	2	5
Chloromethane	13	2/10/99		ug/L	U	2	10
Chrysene	13	2/10/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/10/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/10/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/10/99		ug/L	U	2	10
Dibenzofuran	13	2/10/99		ug/L	U	2	10
Dibromochloromethane	13	2/10/99		ug/L	U	2	5
Dibromomethane	13	2/10/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/10/99		ug/L	U	2	5
Diethylphthalate	13	2/10/99		ug/L	U	2	10
Dimethyl phthalate	13	2/10/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/10/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/10/99		ug/L	U	2	10
Ethylbenzene	13	2/10/99		ug/L	U	2	5
Fluoranthene	13	2/10/99		ug/L	U	2	10
Fluorene	13	2/10/99		ug/L	U	2	10
Hexachlorobenzene	13	2/10/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
Hexachlorocyclopentadiene	13	2/10/99		ug/L	U	2	10

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Page 66 of 159

PW5-12

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Hexachloroethane</b>							
	13	2/10/99		ug/L	U	2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
	13	2/10/99		ug/L	U	2	10
<b>Isophorone</b>							
	13	2/10/99		ug/L	U	2	10
<b>Isopropylbenzene</b>							
	13	2/10/99		ug/L	U	2	5
<b>Methylene Chloride</b>							
	13	2/10/99		ug/L	U	2	5
<b>Naphthalene</b>							
	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
<b>n-Butylbenzene</b>							
	13	2/10/99		ug/L	U	2	5
<b>Nitrobenzene</b>							
	13	2/10/99		ug/L	U	2	10
<b>n-Nitrosodimethylamine</b>							
	13	2/10/99		ug/L	U	2	10
<b>n-Nitroso-di-n-propylamine</b>							
	13	2/10/99		ug/L	U	2	10
<b>n-Nitrosodiphenylamine</b>							
	13	2/10/99		ug/L	U	2	10
<b>n-Propylbenzene</b>							
	13	2/10/99		ug/L	U	2	5
<b>Pentachlorophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>Phenanthrene</b>							
	13	2/10/99		ug/L	U	2	10
<b>Phenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>Pyrene</b>							
	13	2/10/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>sec-Butylbenzene</b>							
	13	2/10/99		ug/L	U	2	5
<b>Styrene</b>							
	13	2/10/99		ug/L	U	2	5
<b>tert-Butylbenzene</b>							
	13	2/10/99		ug/L	U	2	5
<b>Tetrachloroethene</b>							
	13	2/10/99	13	ug/L		2	5
<b>Toluene</b>							
	13	2/10/99		ug/L	U	2	5
<b>trans-1,2-Dichloroethene</b>							
	13	2/10/99		ug/L	U	2	5
<b>trans-1,3-Dichloropropene</b>							
	13	2/10/99		ug/L	U	2	5
<b>Trichloroethene</b>							
	13	2/10/99		ug/L	U	2	5
<b>Trichlorofluoromethane</b>							
	13	2/10/99		ug/L	U	2	5
<b>Vinyl Chloride</b>							
	13	2/10/99		ug/L	U	2	10
<b>Xylenes (Total)</b>							
	13	2/10/99		ug/L	U	2	5

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-13</b>							
1,1,1,2-Tetrachloroethane	13	2/9/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/9/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/9/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/9/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/9/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/9/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/9/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/9/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/9/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/9/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/9/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/9/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
1,2-Dichloroethane	13	2/9/99		ug/L	U	2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/9/99		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	13	2/9/99		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
<b>1,3-Dichloropropane</b>							
	13	2/9/99		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
<b>2,2-Dichloropropane</b>							
	13	2/9/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	13	2/9/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	13	2/9/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	13	2/9/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	13	2/9/99		ug/L	U	10	50
<b>2-Butanone</b>							
	13	2/9/99		ug/L	U	2	10
<b>2-Chloronaphthalene</b>							
	13	2/9/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	13	2/9/99		ug/L	U	2	10

## Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 68 of 159

PW5-13

Well ID:								Well ID:							
Analyte	Round	Date	Results	Units	Flag	MDL	PQL	Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/9/99		ug/L	U	2	5	4-Nitroaniline	13	2/9/99		ug/L	U	10	50
2-Hexanone	13	2/9/99		ug/L	U	2	10	4-Nitrophenol	13	2/9/99		ug/L	U	10	50
2-Methylnaphthalene	13	2/9/99		ug/L	U	2	10	Acenaphthene	13	2/9/99		ug/L	U	2	10
2-Methylphenol	13	2/9/99		ug/L	U	2	10	Acenaphthylene	13	2/9/99		ug/L	U	2	10
2-Nitroaniline	13	2/9/99		ug/L	U	10	50	Acetone	13	2/9/99	4	ug/L	JB	2	10
2-Nitrophenol	13	2/9/99		ug/L	U	2	10	Acrylonitrile	13	2/9/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/9/99		ug/L	U	4	20	Anthracene	13	2/9/99		ug/L	U	2	10
3-Nitroaniline	13	2/9/99		ug/L	U	10	50	Azobenzene	13	2/9/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/9/99		ug/L	U	10	50	Benzene	13	2/9/99		ug/L	U	2	5
4-Bromophenyl-phenylether	13	2/9/99		ug/L	U	2	10	Benzo(a)anthracene	13	2/9/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/9/99		ug/L	U	2	10	Benzo(a)pyrene	13	2/9/99		ug/L	U	2	10
4-Chloroaniline	13	2/9/99		ug/L	U	2	10	Benzo(b)fluoranthene	13	2/9/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/9/99		ug/L	U	2	10	Benzo(g,h,i)perylene	13	2/9/99		ug/L	U	2	10
4-Chlorotoluene	13	2/9/99		ug/L	U	2	5	Benzo(k)fluoranthene	13	2/9/99		ug/L	U	2	10
4-Isopropyltoluene	13	2/9/99		ug/L	U	2	5	Benzoic Acid	13	2/9/99		ug/L	U	10	50
4-Methyl-2-Pentanone	13	2/9/99		ug/L	U	2	10	Benzyl Alcohol	13	2/9/99		ug/L	U	2	10
4-Methylphenol	13	2/9/99		ug/L	U	2	10	Bis(2-chloroethoxy)methane	13	2/9/99		ug/L	U	2	10

**Volatile Organics**
**Qualifiers = (Based on EPA CLP 3/90)**

U = analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/9/99	25	ug/L	B	2	10
Bromobenzene	13	2/9/99		ug/L	U	2	5
Bromochloromethane	13	2/9/99		ug/L	U	2	5
Bromodichloromethane	13	2/9/99		ug/L	U	2	5
Bromoform	13	2/9/99		ug/L	U	2	5
Bromomethane	13	2/9/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/9/99		ug/L	U	2	10
Carbon Disulfide	13	2/9/99	13	ug/L		2	5
Carbon Tetrachloride	13	2/9/99		ug/L	U	2	5
Chlorobenzene	13	2/9/99		ug/L	U	2	5
Chloroethane	13	2/9/99		ug/L	U	2	10
Chloroform	13	2/9/99		ug/L	U	2	5
Chloromethane	13	2/9/99		ug/L	U	2	10
Chrysene	13	2/9/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/9/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/9/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/9/99		ug/L	U	2	10
Dibenzofuran	13	2/9/99		ug/L	U	2	10
Dibromochloromethane	13	2/9/99		ug/L	U	2	5
Dibromomethane	13	2/9/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/9/99		ug/L	U	2	5
Diethylphthalate	13	2/9/99		ug/L	U	2	10
Dimethyl phthalate	13	2/9/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/9/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/9/99		ug/L	U	2	10
Ethylbenzene	13	2/9/99		ug/L	U	2	5
Fluoranthene	13	2/9/99		ug/L	U	2	10
Fluorene	13	2/9/99		ug/L	U	2	10
Hexachlorobenzene	13	2/9/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/9/99		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	5
Hexachlorocyclopentadiene	13	2/9/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 70 of 159

PW5-13

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/9/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/9/99		ug/L	U	2	10
Isophorone	13	2/9/99		ug/L	U	2	10
Isopropylbenzene	13	2/9/99		ug/L	U	2	5
Methylene Chloride	13	2/9/99		ug/L	U	2	5
Naphthalene	13	2/9/99		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	5
n-Butylbenzene	13	2/9/99		ug/L	U	2	5
Nitrobenzene	13	2/9/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/9/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/9/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/9/99		ug/L	U	2	10
n-Propylbenzene	13	2/9/99		ug/L	U	2	5
Pentachlorophenol	13	2/9/99		ug/L	U	10	50
Phenanthrene	13	2/9/99		ug/L	U	2	10
Phenol	13	2/9/99		ug/L	U	2	10
Pyrene	13	2/9/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/9/99		ug/L	U	2	5
Styrene	13	2/9/99		ug/L	U	2	5
tert-Butylbenzene	13	2/9/99		ug/L	U	2	5
Tetrachloroethene	13	2/9/99		ug/L	U	2	5
Toluene	13	2/9/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/9/99		ug/L	U	2	5
trans-1,3-Dichloropropene	13	2/9/99		ug/L	U	2	5
Trichloroethene	13	2/9/99	6.6	ug/L		2	5
Trichlorofluoromethane	13	2/9/99		ug/L	U	2	5
Vinyl Chloride	13	2/9/99		ug/L	U	2	10
Xylenes (Total)	13	2/9/99		ug/L	U	2	5

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-14</b>							
1,1,1,2-Tetrachloroethane	13	2/9/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/9/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/9/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/9/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/9/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/9/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/9/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/9/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/9/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/9/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/9/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/9/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
1,2-Dichloroethane	13	2/9/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
1,2-Dichloropropane	13	2/9/99		ug/L	U	2	5
1,3,5-Trimethylbenzene	13	2/9/99		ug/L	U	2	5
1,3-Dichlorobenzene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
1,3-Dichloropropane	13	2/9/99		ug/L	U	2	5
1,4-Dichlorobenzene	13	2/9/99		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	5
2,2-Dichloropropane	13	2/9/99		ug/L	U	2	5
2,4,5-Trichlorophenol	13	2/9/99		ug/L	U	10	50
2,4,6-Trichlorophenol	13	2/9/99		ug/L	U	2	10
2,4-Dichlorophenol	13	2/9/99		ug/L	U	2	10
2,4-Dimethylphenol	13	2/9/99		ug/L	U	2	10
2,4-Dinitrophenol	13	2/9/99		ug/L	U	10	50
2,4-Dinitrotoluene	13	2/9/99		ug/L	U	2	10
2,6-Dinitrotoluene	13	2/9/99		ug/L	U	10	50
2-Butanone	13	2/9/99		ug/L	U	2	10
2-Chloronaphthalene	13	2/9/99		ug/L	U	2	10
2-Chlorophenol	13	2/9/99		ug/L	U	2	10

**Volatile Organics**

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MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/9/99		ug/L	U	2	5
2-Hexanone	13	2/9/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/9/99		ug/L	U	2	10
2-Methylphenol	13	2/9/99		ug/L	U	2	10
2-Nitroaniline	13	2/9/99		ug/L	U	10	50
2-Nitrophenol	13	2/9/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/9/99		ug/L	U	4	20
3-Nitroaniline	13	2/9/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/9/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/9/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/9/99		ug/L	U	2	10
4-Chloroaniline	13	2/9/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/9/99		ug/L	U	2	10
4-Chlorotoluene	13	2/9/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/9/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/9/99		ug/L	U	2	10
4-Methylphenol	13	2/9/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/9/99		ug/L	U	10	50
4-Nitrophenol	13	2/9/99		ug/L	U	10	50
Acenaphthene	13	2/9/99		ug/L	U	2	10
Acenaphthylene	13	2/9/99		ug/L	U	2	10
Acetone	13	2/9/99	3.8	ug/L	JB	2	10
Acrylonitrile	13	2/9/99		ug/L	U	2	10
Anthracene	13	2/9/99		ug/L	U	2	10
Azobenzene	13	2/9/99		ug/L	U	10	50
Benzene	13	2/9/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/9/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/9/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/9/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/9/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/9/99		ug/L	U	2	10
Benzoic Acid	13	2/9/99		ug/L	U	10	50
Benzyl Alcohol	13	2/9/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/9/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U = analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/9/99	5.4	ug/L	JB	2	10
Bromobenzene	13	2/9/99		ug/L	U	2	5
Bromochloromethane	13	2/9/99		ug/L	U	2	5
Bromodichloromethane	13	2/9/99		ug/L	U	2	5
Bromoform	13	2/9/99		ug/L	U	2	5
Bromomethane	13	2/9/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/9/99		ug/L	U	2	10
Carbon Disulfide	13	2/9/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/9/99		ug/L	U	2	5
Chlorobenzene	13	2/9/99		ug/L	U	2	5
Chloroethane	13	2/9/99		ug/L	U	2	10
Chloroform	13	2/9/99		ug/L	U	2	5
Chloromethane	13	2/9/99		ug/L	U	2	10
Chrysene	13	2/9/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/9/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/9/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/9/99		ug/L	U	2	10
Dibenzofuran	13	2/9/99		ug/L	U	2	10
Dibromochloromethane	13	2/9/99		ug/L	U	2	5
Dibromomethane	13	2/9/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/9/99		ug/L	U	2	5
Diethylphthalate	13	2/9/99		ug/L	U	2	10
Dimethyl phthalate	13	2/9/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/9/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/9/99		ug/L	U	2	10
Ethylbenzene	13	2/9/99		ug/L	U	2	5
Fluoranthene	13	2/9/99		ug/L	U	2	10
Fluorene	13	2/9/99		ug/L	U	2	10
Hexachlorobenzene	13	2/9/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/9/99		ug/L	U	2	10

**Volatile Organics**

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PQL = Practical Quantitation Limit

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Page 74 of 159

PW5-14

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane							
	13	2/9/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene							
	13	2/9/99		ug/L	U	2	10
Isophorone							
	13	2/9/99		ug/L	U	2	10
Isopropylbenzene							
	13	2/9/99		ug/L	U	2	5
Methylene Chloride							
	13	2/9/99		ug/L	U	2	5
Naphthalene							
	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
n-Butylbenzene							
	13	2/9/99		ug/L	U	2	5
Nitrobenzene							
	13	2/9/99		ug/L	U	2	10
n-Nitrosodimethylamine							
	13	2/9/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine							
	13	2/9/99		ug/L	U	2	10
n-Nitrosodiphenylamine							
	13	2/9/99		ug/L	U	2	10
n-Propylbenzene							
	13	2/9/99		ug/L	U	2	5
Pentachlorophenol							
	13	2/9/99		ug/L	U	10	50
Phenanthrene							
	13	2/9/99		ug/L	U	2	10
Phenol							
	13	2/9/99		ug/L	U	2	10
Pyrene							
	13	2/9/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene							
	13	2/9/99		ug/L	U	2	5
Styrene							
	13	2/9/99		ug/L	U	2	5
tert-Butylbenzene							
	13	2/9/99		ug/L	U	2	5
Tetrachloroethene							
	13	2/9/99		ug/L	U	2	5
Toluene							
	13	2/9/99		ug/L	U	2	5
trans-1,2-Dichloroethene							
	13	2/9/99		ug/L	U	2	5
trans-1,3-Dichloropropene							
	13	2/9/99		ug/L	U	2	5
Trichloroethene							
	13	2/9/99		ug/L	U	2	5
Trichlorofluoromethane							
	13	2/9/99		ug/L	U	2	5
Vinyl Chloride							
	13	2/9/99		ug/L	U	2	10
Xylenes (Total)							
	13	2/9/99		ug/L	U	2	5

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Page 75 of 159

PW5-14

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-15</b>							
<b>1,1,1,2-Tetrachloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1,1-Trichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1,2,2-Tetrachloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1,2-Trichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1-Dichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1-Dichloroethene</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1-Dichloropropene</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2,3-Trichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2,3-Trichloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2,4-Trichlorobenzene</b>							
01	3/12/98		ug/L	U		2	10
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	10
13	2/9/99		ug/L	U		2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2,4-Trimethylbenzene</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2-Dibromo-3-chloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2-Dibromoethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	10
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
13	2/9/99		ug/L	U		2	10
<b>1,2-Dichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,3,5-Trimethylbenzene</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,3-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
01	3/12/98		ug/L	U		2	10
13	2/9/99		ug/L	U		2	5
13	2/9/99		ug/L	U		2	10
<b>1,3-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5

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**Well ID:**

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<b>1,4-Dichlorobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
<b>2,2-Dichloropropane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>2-Butanone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>2-Chloronaphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2-Chlorotoluene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>2-Hexanone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2-Methylnaphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2-Methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>2-Nitrophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>3,3-Dichlorobenzidine</b>							
	01	3/12/98		ug/L	U	4	20
	13	2/9/99		ug/L	U	4	20
<b>3-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>4,4-DDD</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>4,4-DDE</b>							
	01	3/12/98		ug/L	U	0.1	0.1

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<b>4,4-DDT</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>4,6-Dinitro-2-methylphenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>4-Bromophenyl-phenylether</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Chloro-3-methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Chloroaniline</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Chlorophenyl-phenylether</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Chlorotoluene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>4-Isopropyltoluene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>4-Methyl-2-Pentanone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>4-Nitrophenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>Acenaphthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Acenaphthylene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Acetone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99	6.6	ug/L	JB	2	10
<b>Acrolein</b>							
	01	3/12/98		ug/L	U	2	10
<b>Acrylonitrile</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Aldrin</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Alpha-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Azobenzene</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>Benzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Benzo(a)anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

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Page 78 of 159

PW5-15

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Benzo(a)pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Benzo(b)fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Benzo(g,h,i)perylene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Benzo(k)fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Benzoic Acid</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>Benzyl Alcohol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Beta-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Bis(2-chloroethoxy)methane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>bis(2-Chloroethyl) Ether</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>bis(2-Chloroisopropyl) Ether</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>bis(2-ethylhexyl)phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99	26	ug/L	B	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Bromobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Bromochloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Bromodichloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Bromoform</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Bromomethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Butylbenzylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Carbon Disulfide</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Carbon Tetrachloride</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Chlordane</b>							
	01	3/12/98		ug/L	U	0.5	0.5
<b>Chlorobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Chloroethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

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Page 79 of 159

PW5-15

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Chloroform</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Chloromethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Chrysene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>cis-1,2-Dichloroethene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>cis-1,3-Dichloropropene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Delta-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Dibenzo(a,h)anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Dibenzofuran</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Dibromochloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Dibromomethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Dichlorodifluoromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Dieldrin</b>							
	01	3/12/98		ug/L	U	0.1	0.1

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Diethylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Dimethyl phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Di-n-butylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>di-n-octyl phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Endosulfan I</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Endosulfan II</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endosulfan Sulfate</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin Aldehyde</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin Ketone</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Ethylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Fluorene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

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Page 80 of 159

PW5-15



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Gamma-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Heptachlor</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Heptachlor Epoxide</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Hexachlorobenzene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Hexachlorobutadiene</b>							
	01	3/12/98		ug/L	U	2	10
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
<b>Hexachlorocyclopentadiene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Hexachloroethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Isophorone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Isopropylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Methoxychlor</b>							
	01	3/12/98		ug/L	U	0.5	0.5
<b>Methylene Chloride</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Naphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
<b>n-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Nitrobenzene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>n-Nitrosodimethylamine</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>n-Nitroso-di-n-propylamine</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>n-Nitrosodiphenylamine</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>n-Propylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Pentachlorophenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>Phenanthrene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Phenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>sec-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Styrene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>tert-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Tetrachloroethene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Toluene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Toxaphene</b>							
	01	3/12/98		ug/L	U	1	1
<b>trans-1,2-Dichloroethene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99	4.5	ug/L	J	2	5
<b>trans-1,3-Dichloropropene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Trichloroethene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Trichlorofluoromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Vinyl Acetate</b>							
	01	3/12/98		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Vinyl Chloride</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Xylenes (Total)</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5

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Page 82 of 159

PW5-15

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-16</b>							
<b>1,1,1,2-Tetrachloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,1,1-Trichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,1,2,2-Tetrachloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,1,2-Trichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,1-Dichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,1-Dichloroethene</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,1-Dichloropropene</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,2,3-Trichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,2,3-Trichloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,2,4-Trichlorobenzene</b>							
01	3/12/98		ug/L	U		2	5
01	3/12/98		ug/L	U		2	10
13	2/10/99		ug/L	U		2	10
13	2/10/99		ug/L	U		2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2,4-Trimethylbenzene</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,2-Dibromo-3-chloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,2-Dibromoethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,2-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	10
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
13	2/10/99		ug/L	U		2	10
<b>1,2-Dichloroethane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,2-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,3,5-Trimethylbenzene</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5
<b>1,3-Dichlorobenzene</b>							
01	3/12/98		ug/L	U		2	10
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	10
13	2/10/99		ug/L	U		2	5
<b>1,3-Dichloropropane</b>							
01	3/12/98		ug/L	U		2	5
13	2/10/99		ug/L	U		2	5

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<b>1,4-Dichlorobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
<b>2,2-Dichloropropane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/10/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/10/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/10/99		ug/L	U	10	50
<b>2-Butanone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>2-Chloronaphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>2-Chlorotoluene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>2-Hexanone</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>2-Methylnaphthalene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>2-Methylphenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>2-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/10/99		ug/L	U	10	50
<b>2-Nitrophenol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>3,3-Dichlorobenzidine</b>							
	01	3/12/98		ug/L	U	4	20
	13	2/10/99		ug/L	U	4	20
<b>3-Nitroaniline</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/10/99		ug/L	U	10	50
<b>4,4-DDD</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>4,4-DDE</b>							
	01	3/12/98		ug/L	U	0.1	0.1

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Page 84 of 159

PW5-16

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4,4-DDT	01	3/12/98		ug/L	U	0.1	0.1
4,6-Dinitro-2-methylphenol	01	3/12/98		ug/L	U	10	50
	13	2/10/99		ug/L	U	10	50
4-Bromophenyl-phenylether	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
4-Chloro-3-methylphenol	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
4-Chloroaniline	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
4-Chlorotoluene	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
4-Isopropyltoluene	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
4-Methyl-2-Pentanone	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
4-Methylphenol	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
4-Nitroaniline	01	3/12/98		ug/L	U	10	50
	13	2/10/99		ug/L	U	10	50

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitrophenol	01	3/12/98		ug/L	U	10	50
	13	2/10/99		ug/L	U	10	50
Acenaphthene	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
Acenaphthylene	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
Acetone	01	3/12/98		ug/L	U	2	10
	13	2/10/99	240	ug/L		2	10
Acrolein	01	3/12/98		ug/L	U	2	10
Acrylonitrile	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
Aldrin	01	3/12/98		ug/L	U	0.05	0.05
Alpha-BHC	01	3/12/98		ug/L	U	0.05	0.05
Anthracene	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
Azobenzene	01	3/12/98		ug/L	U	10	50
	13	2/10/99		ug/L	U	10	50
Benzene	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
Benzo(a)anthracene	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10

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Page 85 of 159

PW5-16

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<b>Benzo(a)pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Benzo(b)fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Benzo(g,h,i)perylene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Benzo(k)fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Benzoic Acid</b>							
	01	3/12/98		ug/L	U	10	50
	13	2/10/99		ug/L	U	10	50
<b>Benzyl Alcohol</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Beta-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Bis(2-chloroethoxy)methane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>bis(2-Chloroethyl) Ether</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>bis(2-Chloroisopropyl) Ether</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>bis(2-ethylhexyl)phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Bromobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Bromochloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Bromodichloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Bromoform</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Bromomethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Butylbenzylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Carbon Disulfide</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99	3	ug/L	J	2	5
<b>Carbon Tetrachloride</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Chlordane</b>							
	01	3/12/98		ug/L	U	0.5	0.5
<b>Chlorobenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Chloroethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10

## Volatile Organics

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Page 86 of 159

PW5-16

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Chloroform</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99	27	ug/L		2	5
<b>Chloromethane</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Chrysene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>cis-1,2-Dichloroethene</b>							
	01	3/12/98	120	ug/L		2	5
	13	2/10/99	460	ug/L		20	50
<b>cis-1,3-Dichloropropene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Delta-BHC</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Dibenzo(a,h)anthracene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Dibenzofuran</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Dibromochloromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Dibromomethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Dichlorodifluoromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Dieldrin</b>							
	01	3/12/98		ug/L	U	0.1	0.1

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Diethylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Dimethyl phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Di-n-butylphthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>di-n-octyl phthalate</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Endosulfan I</b>							
	01	3/12/98		ug/L	U	0.05	0.05
<b>Endosulfan II</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endosulfan Sulfate</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin Aldehyde</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Endrin Ketone</b>							
	01	3/12/98		ug/L	U	0.1	0.1
<b>Ethylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Fluoranthene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>Fluorene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Gamma-BHC</b>							
01	3/12/98			ug/L	U	0.05	0.05
<b>Heptachlor</b>							
01	3/12/98			ug/L	U	0.05	0.05
<b>Heptachlor Epoxide</b>							
01	3/12/98			ug/L	U	0.05	0.05
<b>Hexachlorobenzene</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
<b>Hexachlorobutadiene</b>							
01	3/12/98			ug/L	U	2	10
01	3/12/98			ug/L	U	2	5
13	2/10/99			ug/L	U	2	5
13	2/10/99			ug/L	U	2	10
<b>Hexachlorocyclopentadiene</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
<b>Hexachloroethane</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
<b>Isophorone</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
<b>Isopropylbenzene</b>							
01	3/12/98			ug/L	U	2	5
13	2/10/99			ug/L	U	2	5
<b>Methoxychlor</b>							
01	3/12/98			ug/L	U	0.5	0.5
<b>Methylene Chloride</b>							
01	3/12/98			ug/L	U	2	5
13	2/10/99			ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Naphthalene</b>							
01	3/12/98			ug/L	U	2	5
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
13	2/10/99			ug/L	U	2	5
<b>n-Butylbenzene</b>							
01	3/12/98			ug/L	U	2	5
13	2/10/99			ug/L	U	2	5
<b>Nitrobenzene</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
<b>n-Nitrosodimethylamine</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
<b>n-Nitroso-di-n-propylamine</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
<b>n-Nitrosodiphenylamine</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
<b>n-Propylbenzene</b>							
01	3/12/98			ug/L	U	2	5
13	2/10/99			ug/L	U	2	5
<b>Pentachlorophenol</b>							
01	3/12/98			ug/L	U	10	50
13	2/10/99			ug/L	U	10	50
<b>Phenanthrene</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10
<b>Phenol</b>							
01	3/12/98			ug/L	U	2	10
13	2/10/99			ug/L	U	2	10

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Page 88 of 159

PW5-16



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Pyrene</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	10
<b>sec-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Styrene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>tert-Butylbenzene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Tetrachloroethene</b>							
	01	3/12/98	1100	ug/L		2	5
	13	2/10/99	51	ug/L		2	5
<b>Toluene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Toxaphene</b>							
	01	3/12/98		ug/L	U	1	1
<b>trans-1,2-Dichloroethene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99	9.7	ug/L		2	5
<b>trans-1,3-Dichloropropene</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Trichloroethene</b>							
	01	3/12/98	86	ug/L		2	5
	13	2/10/99	32	ug/L		2	5
<b>Trichlorofluoromethane</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5
<b>Vinyl Acetate</b>							
	01	3/12/98		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Vinyl Chloride</b>							
	01	3/12/98		ug/L	U	2	10
	13	2/10/99	770	ug/L		20	100
<b>Xylenes (Total)</b>							
	01	3/12/98		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	5

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
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**PW5-17****1,1,1,2-Tetrachloroethane**

13	2/9/99	ug/L	U	2	5
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**1,1,1-Trichloroethane**

13	2/9/99	ug/L	U	2	5
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**1,1,2,2-Tetrachloroethane**

13	2/9/99	ug/L	U	2	5
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**1,1,2-Trichloroethane**

13	2/9/99	ug/L	U	2	5
----	--------	------	---	---	---

**1,1-Dichloroethane**

13	2/9/99	ug/L	U	2	5
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**1,1-Dichloroethene**

13	2/9/99	ug/L	U	2	5
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**1,1-Dichloropropene**

13	2/9/99	ug/L	U	2	5
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**1,2,3-Trichlorobenzene**

13	2/9/99	ug/L	U	2	5
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**1,2,3-Trichloropropane**

13	2/9/99	ug/L	U	2	5
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**1,2,4-Trichlorobenzene**

13	2/9/99	ug/L	U	2	5
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13	2/9/99	ug/L	U	2	10
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**1,2,4-Trimethylbenzene**

13	2/9/99	ug/L	U	2	5
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**1,2-Dibromo-3-chloropropane**

13	2/9/99	ug/L	U	2	5
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**1,2-Dibromoethane**

13	2/9/99	ug/L	U	2	5
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**1,2-Dichlorobenzene**

13	2/9/99	ug/L	U	2	5
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13	2/9/99	ug/L	U	2	10
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**1,2-Dichloroethane**

13	2/9/99	ug/L	U	2	5
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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
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**1,2-Dichloropropane**

13	2/9/99	ug/L	U	2	5
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**1,3,5-Trimethylbenzene**

13	2/9/99	ug/L	U	2	5
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**1,3-Dichlorobenzene**

13	2/9/99	ug/L	U	2	10
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13	2/9/99	ug/L	U	2	5
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**1,3-Dichloropropane**

13	2/9/99	ug/L	U	2	5
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**1,4-Dichlorobenzene**

13	2/9/99	ug/L	U	2	5
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13	2/9/99	ug/L	U	2	10
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**2,2-Dichloropropane**

13	2/9/99	ug/L	U	2	5
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**2,4,5-Trichlorophenol**

13	2/9/99	ug/L	U	10	50
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**2,4,6-Trichlorophenol**

13	2/9/99	ug/L	U	2	10
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**2,4-Dichlorophenol**

13	2/9/99	ug/L	U	2	10
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**2,4-Dimethylphenol**

13	2/9/99	ug/L	U	2	10
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**2,4-Dinitrophenol**

13	2/9/99	ug/L	U	10	50
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**2,4-Dinitrotoluene**

13	2/9/99	ug/L	U	2	10
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**2,6-Dinitrotoluene**

13	2/9/99	ug/L	U	10	50
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**2-Butanone**

13	2/9/99	ug/L	U	2	10
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**2-Chloronaphthalene**

13	2/9/99	ug/L	U	2	10
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**2-Chlorophenol**

13	2/9/99	ug/L	U	2	10
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Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/9/99		ug/L	U	2	5
2-Hexanone	13	2/9/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/9/99		ug/L	U	2	10
2-Methylphenol	13	2/9/99		ug/L	U	2	10
2-Nitroaniline	13	2/9/99		ug/L	U	10	50
2-Nitrophenol	13	2/9/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/9/99		ug/L	U	4	20
3-Nitroaniline	13	2/9/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/9/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/9/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/9/99		ug/L	U	2	10
4-Chloroaniline	13	2/9/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/9/99		ug/L	U	2	10
4-Chlorotoluene	13	2/9/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/9/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/9/99		ug/L	U	2	10
4-Methylphenol	13	2/9/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/9/99		ug/L	U	10	50
4-Nitrophenol	13	2/9/99		ug/L	U	10	50
Acenaphthene	13	2/9/99		ug/L	U	2	10
Acenaphthylene	13	2/9/99		ug/L	U	2	10
Acetone	13	2/9/99		ug/L	U	2	10
Acrylonitrile	13	2/9/99		ug/L	U	2	10
Anthracene	13	2/9/99		ug/L	U	2	10
Azobenzene	13	2/9/99		ug/L	U	10	50
Benzene	13	2/9/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/9/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/9/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/9/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/9/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/9/99		ug/L	U	2	10
Benzoic Acid	13	2/9/99		ug/L	U	10	50
Benzyl Alcohol	13	2/9/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/9/99		ug/L	U	2	10

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Page 91 of 159

PWS-17

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/9/99	4.9	ug/L	JB	2	10
Bromobenzene	13	2/9/99		ug/L	U	2	5
Bromochloromethane	13	2/9/99		ug/L	U	2	5
Bromodichloromethane	13	2/9/99		ug/L	U	2	5
Bromoform	13	2/9/99		ug/L	U	2	5
Bromomethane	13	2/9/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/9/99		ug/L	U	2	10
Carbon Disulfide	13	2/9/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/9/99		ug/L	U	2	5
Chlorobenzene	13	2/9/99		ug/L	U	2	5
Chloroethane	13	2/9/99		ug/L	U	2	10
Chloroform	13	2/9/99		ug/L	U	2	5
Chloromethane	13	2/9/99		ug/L	U	2	10
Chrysene	13	2/9/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/9/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/9/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/9/99		ug/L	U	2	10
Dibenzofuran	13	2/9/99		ug/L	U	2	10
Dibromochloromethane	13	2/9/99		ug/L	U	2	5
Dibromomethane	13	2/9/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/9/99		ug/L	U	2	5
Diethylphthalate	13	2/9/99		ug/L	U	2	10
Dimethyl phthalate	13	2/9/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/9/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/9/99		ug/L	U	2	10
Ethylbenzene	13	2/9/99		ug/L	U	2	5
Fluoranthene	13	2/9/99		ug/L	U	2	10
Fluorene	13	2/9/99		ug/L	U	2	10
Hexachlorobenzene	13	2/9/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/9/99		ug/L	U	2	10

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Page 92 of 159

PW5-17

Well ID:								Well ID:							
Analyte	Round	Date	Results	Units	Flag	MDL	PQL	Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/9/99		ug/L	U	2	10	sec-Butylbenzene	13	2/9/99		ug/L	U	2	5
Indeno(1,2,3-cd)pyrene	13	2/9/99		ug/L	U	2	10	Styrene	13	2/9/99		ug/L	U	2	5
Isophorone	13	2/9/99		ug/L	U	2	10	tert-Butylbenzene	13	2/9/99		ug/L	U	2	5
Isopropylbenzene	13	2/9/99		ug/L	U	2	5	Tetrachloroethene	13	2/9/99		ug/L	U	2	5
Methylene Chloride	13	2/9/99		ug/L	U	2	5	Toluene	13	2/9/99		ug/L	U	2	5
Naphthalene	13	2/9/99		ug/L	U	2	5	trans-1,2-Dichloroethene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10	trans-1,3-Dichloropropene	13	2/9/99		ug/L	U	2	5
n-Butylbenzene	13	2/9/99		ug/L	U	2	5	Trichloroethene	13	2/9/99		ug/L	U	2	5
Nitrobenzene	13	2/9/99		ug/L	U	2	10	Trichlorofluoromethane	13	2/9/99		ug/L	U	2	5
n-Nitrosodimethylamine	13	2/9/99		ug/L	U	2	10	Vinyl Chloride	13	2/9/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/9/99		ug/L	U	2	10	Xylenes (Total)	13	2/9/99		ug/L	U	2	5
n-Nitrosodiphenylamine	13	2/9/99		ug/L	U	2	10								
n-Propylbenzene	13	2/9/99		ug/L	U	2	5								
Pentachlorophenol	13	2/9/99		ug/L	U	10	50								
Phenanthrene	13	2/9/99		ug/L	U	2	10								
Phenol	13	2/9/99		ug/L	U	2	10								
Pyrene	13	2/9/99		ug/L	U	2	10								

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Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-18</b>							
<b>1,1,1,2-Tetrachloroethane</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1,1-Trichloroethane</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1,1,2-Tetrachloroethane</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1,2-Trichloroethane</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1-Dichloroethane</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1-Dichloroethene</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,1-Dichloropropene</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2,3-Trichlorobenzene</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2,3-Trichloropropane</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2,4-Trichlorobenzene</b>							
01	3/11/98		ug/L	U		2	10
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	10
13	2/9/99		ug/L	U		2	5
<b>1,2,4-Trimethylbenzene</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2-Dibromo-3-chloropropane</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2-Dibromoethane</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5
<b>1,2-Dichlorobenzene</b>							
01	3/11/98		ug/L	U		2	5
01	3/11/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	10
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	10
13	2/9/99		ug/L	U		2	5
<b>1,2-Dichloroethane</b>							
01	3/11/98		ug/L	U		2	5
09	9/8/98		ug/L	U		2	5
13	2/9/99		ug/L	U		2	5

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<b>1,2-Dichloropropane</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	01	3/11/98		ug/L	U	2	5
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	5
<b>1,3-Dichloropropane</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	01	3/11/98		ug/L	U	2	10
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	5
<b>2,2-Dichloropropane</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>2,4,6-Trichlorophenol</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>2-Butanone</b>							
	01	3/11/98	32	ug/L		2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2-Chloronaphthalene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

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<b>2-Chlorophenol</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2-Chlorotoluene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>2-Hexanone</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2-Methylnaphthalene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2-Methylphenol</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>2-Nitroaniline</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>2-Nitrophenol</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>3,3-Dichlorobenzidine</b>							
	01	3/11/98		ug/L	U	4	20
	09	9/8/98		ug/L	U	4	20
	13	2/9/99		ug/L	U	4	20

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>3-Nitroaniline</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>4,4-DDD</b>							
	01	3/11/98		ug/L	U	0.1	0.1
<b>4,4-DDE</b>							
	01	3/11/98		ug/L	U	0.1	0.1
<b>4,4-DDT</b>							
	01	3/11/98		ug/L	U	0.1	0.1
<b>4,6-Dinitro-2-methylphenol</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>4-Bromophenyl-phenylether</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Chloro-3-methylphenol</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Chloroaniline</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Chlorophenyl-phenylether</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Chlorotoluene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5

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<b>4-Isopropyltoluene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>4-Methyl-2-Pentanone</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Methylphenol</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>4-Nitroaniline</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>4-Nitrophenol</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>Acenaphthene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Acenaphthylene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Acetone</b>							
	01	3/11/98	36	ug/L		2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

## Well ID:

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<b>Acrolein</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
<b>Acrylonitrile</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Aldrin</b>							
	01	3/11/98		ug/L	U	0.05	0.05
<b>Alpha-BHC</b>							
	01	3/11/98		ug/L	U	0.05	0.05
<b>Anthracene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Azobenzene</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>Benzene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Benzo(a)anthracene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Benzo(a)pyrene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

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<b>Benzo(b)fluoranthene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Benzo(g,h,i)perylene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Benzo(k)fluoranthene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Benzoic Acid</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>Benzyl Alcohol</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Beta-BHC</b>							
	01	3/11/98		ug/L	U	0.05	0.05
<b>Bis(2-chloroethoxy)methane</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>bis(2-Chloroethyl) Ether</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>bis(2-Chloroisopropyl) Ether</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>bis(2-ethylhexyl)phthalate</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99	5.4	ug/L	JB	2	10
<b>Bromobenzene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Bromochloromethane</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Bromodichloromethane</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Bromoform</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Bromomethane</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Butylbenzylphthalate</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Carbon Disulfide</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Carbon Tetrachloride</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Chlordane</b>							
	01	3/11/98		ug/L	U	0.5	0.5
<b>Chlorobenzene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Chloroethane</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Chloroform</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Chloromethane</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Chrysene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>cis-1,2-Dichloroethene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>cis-1,3-Dichloropropene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Delta-BHC</b>							
	01	3/11/98		ug/L	U	0.05	0.05
<b>Dibenzo(a,h)anthracene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Dibenzofuran</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Dibromochloromethane</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Dibromomethane</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Dichlorodifluoromethane</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Dieldrin</b>							
	01	3/11/98		ug/L	U	0.1	0.1
<b>Diethylphthalate</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Dimethyl phthalate</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

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Page 99 of 159

**PW5-18**

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Di-n-butylphthalate</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>di-n-octyl phthalate</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Endosulfan I</b>							
	01	3/11/98		ug/L	U	0.05	0.05
<b>Endosulfan II</b>							
	01	3/11/98		ug/L	U	0.1	0.1
<b>Endosulfan Sulfate</b>							
	01	3/11/98		ug/L	U	0.1	0.1
<b>Endrin</b>							
	01	3/11/98		ug/L	U	0.1	0.1
<b>Endrin Aldehyde</b>							
	01	3/11/98		ug/L	U	0.1	0.1
<b>Endrin Ketone</b>							
	01	3/11/98		ug/L	U	0.1	0.1
<b>Ethylbenzene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Fluoranthene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Fluorene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Gamma-BHC</b>							
	01	3/11/98		ug/L	U	0.05	0.05

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Heptachlor</b>							
	01	3/11/98		ug/L	U	0.05	0.05
<b>Heptachlor Epoxide</b>							
	01	3/11/98		ug/L	U	0.05	0.05
<b>Hexachlorobenzene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Hexachlorobutadiene</b>							
	01	3/11/98		ug/L	U	2	5
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
<b>Hexachlorocyclopentadiene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Hexachloroethane</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Isophorone</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

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Isopropylbenzene							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
Methoxychlor							
	01	3/11/98		ug/L	U	0.5	0.5
Methylene Chloride							
	01	3/11/98	3.7	ug/L	U	2	5
	09	9/8/98		ug/L	J	2	5
	13	2/9/99		ug/L	U	2	5
Naphthalene							
	01	3/11/98		ug/L	U	2	5
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
n-Butylbenzene							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
Nitrobenzene							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
n-Nitrosodimethylamine							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10

**Well ID:**

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<b>n-Nitrosodiphenylamine</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>n-Propylbenzene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Pentachlorophenol</b>							
	01	3/11/98		ug/L	U	10	50
	09	9/8/98		ug/L	U	10	50
	13	2/9/99		ug/L	U	10	50
<b>Phenanthrene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Phenol</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Pyrene</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>sec-Butylbenzene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Styrene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5

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<b>tert-Butylbenzene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Tetrachloroethene</b>							
	01	3/11/98	2.4	ug/L	J	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Toluene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Toxaphene</b>							
	01	3/11/98		ug/L	U	1	1
<b>trans-1,2-Dichloroethene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>trans-1,3-Dichloropropene</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Trichloroethene</b>							
	01	3/11/98	2.1	ug/L	J	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Trichlorofluoromethane</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5
<b>Vinyl Acetate</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Vinyl Chloride</b>							
	01	3/11/98		ug/L	U	2	10
	09	9/8/98		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	10
<b>Xylenes (Total)</b>							
	01	3/11/98		ug/L	U	2	5
	09	9/8/98		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	5

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Page 102 of 159

PW5-18

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-18D</b>							
1,1,1,2-Tetrachloroethane	01	3/11/98		ug/L	U	2	5
1,1,1-Trichloroethane	01	3/11/98		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	01	3/11/98		ug/L	U	2	5
1,1,2-Trichloroethane	01	3/11/98		ug/L	U	2	5
1,1-Dichloroethane	01	3/11/98		ug/L	U	2	5
1,1-Dichloroethene	01	3/11/98		ug/L	U	2	5
1,1-Dichloropropene	01	3/11/98		ug/L	U	2	5
1,2,3-Trichlorobenzene	01	3/11/98		ug/L	U	2	5
1,2,3-Trichloropropane	01	3/11/98		ug/L	U	2	5
1,2,4-Trichlorobenzene	01	3/11/98		ug/L	U	2	5
	01	3/11/98		ug/L	U	2	10
1,2,4-Trimethylbenzene	01	3/11/98		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	01	3/11/98		ug/L	U	2	5
1,2-Dibromoethane	01	3/11/98		ug/L	U	2	5
1,2-Dichlorobenzene	01	3/11/98		ug/L	U	2	10
	01	3/11/98		ug/L	U	2	5
1,2-Dichloroethane	01	3/11/98		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	01	3/11/98		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	01	3/11/98		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	01	3/11/98		ug/L	U	2	10
	01	3/11/98		ug/L	U	2	5
<b>1,3-Dichloropropane</b>							
	01	3/11/98		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	01	3/11/98		ug/L	U	2	5
	01	3/11/98		ug/L	U	2	10
<b>2,2-Dichloropropane</b>							
	01	3/11/98		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	01	3/11/98		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	01	3/11/98		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	01	3/11/98		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	01	3/11/98		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	01	3/11/98		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	01	3/11/98		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	01	3/11/98		ug/L	U	10	50
<b>2-Butanone</b>							
	01	3/11/98	24	ug/L		2	10
<b>2-Chloronaphthalene</b>							
	01	3/11/98		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	01	3/11/98		ug/L	U	2	10

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Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene							
	01	3/11/98		ug/L	U	2	5
2-Hexanone							
	01	3/11/98		ug/L	U	2	10
2-Methylnaphthalene							
	01	3/11/98		ug/L	U	2	10
2-Methylphenol							
	01	3/11/98		ug/L	U	2	10
2-Nitroaniline							
	01	3/11/98		ug/L	U	10	50
2-Nitrophenol							
	01	3/11/98		ug/L	U	2	10
3,3-Dichlorobenzidine							
	01	3/11/98		ug/L	U	4	20
3-Nitroaniline							
	01	3/11/98		ug/L	U	10	50
4,4-DDD							
	01	3/11/98		ug/L	U	0.1	0.1
4,4-DDE							
	01	3/11/98		ug/L	U	0.1	0.1
4,4-DDT							
	01	3/11/98		ug/L	U	0.1	0.1
4,6-Dinitro-2-methylphenol							
	01	3/11/98		ug/L	U	10	50
4-Bromophenyl-phenylether							
	01	3/11/98		ug/L	U	2	10
4-Chloro-3-methylphenol							
	01	3/11/98		ug/L	U	2	10
4-Chloroaniline							
	01	3/11/98		ug/L	U	2	10
4-Chlorophenyl-phenylether							
	01	3/11/98		ug/L	U	2	10
4-Chlorotoluene							
	01	3/11/98		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Isopropyltoluene							
	01	3/11/98		ug/L	U	2	5
4-Methyl-2-Pentanone							
	01	3/11/98		ug/L	U	2	10
4-Methylphenol							
	01	3/11/98		ug/L	U	2	10
4-Nitroaniline							
	01	3/11/98		ug/L	U	10	50
4-Nitrophenol							
	01	3/11/98		ug/L	U	10	50
Acenaphthene							
	01	3/11/98		ug/L	U	2	10
Acenaphthylene							
	01	3/11/98		ug/L	U	2	10
Acetone							
	01	3/11/98	36	ug/L		2	10
Acrolein							
	01	3/11/98		ug/L	U	2	10
Acrylonitrile							
	01	3/11/98		ug/L	U	2	10
Aldrin							
	01	3/11/98		ug/L	U	0.05	0.05
Alpha-BHC							
	01	3/11/98		ug/L	U	0.05	0.05
Anthracene							
	01	3/11/98		ug/L	U	2	10
Azobenzene							
	01	3/11/98		ug/L	U	10	50
Benzene							
	01	3/11/98		ug/L	U	2	5
Benzo(a)anthracene							
	01	3/11/98		ug/L	U	2	10
Benzo(a)pyrene							
	01	3/11/98		ug/L	U	2	10

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Page 104 of 159

PW5-18D



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Benzo(b)fluoranthene	01	3/11/98		ug/L	U	2	10
Benzo(g,h,i)perylene	01	3/11/98		ug/L	U	2	10
Benzo(k)fluoranthene	01	3/11/98		ug/L	U	2	10
Benzoic Acid	01	3/11/98		ug/L	U	10	50
Benzyl Alcohol	01	3/11/98		ug/L	U	2	10
Beta-BHC	01	3/11/98		ug/L	U	0.05	0.05
Bis(2-chloroethoxy)methane	01	3/11/98		ug/L	U	2	10
bis(2-Chloroethyl) Ether	01	3/11/98		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	01	3/11/98		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	01	3/11/98		ug/L	U	2	10
Bromobenzene	01	3/11/98		ug/L	U	2	5
Bromochloromethane	01	3/11/98		ug/L	U	2	5
Bromodichloromethane	01	3/11/98		ug/L	U	2	5
Bromoform	01	3/11/98		ug/L	U	2	5
Bromomethane	01	3/11/98		ug/L	U	2	10
Butylbenzylphthalate	01	3/11/98		ug/L	U	2	10
Carbon Disulfide	01	3/11/98		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Carbon Tetrachloride	01	3/11/98		ug/L	U	2	5
Chlordane	01	3/11/98		ug/L	U	0.5	0.5
Chlorobenzene	01	3/11/98		ug/L	U	2	5
Chloroethane	01	3/11/98		ug/L	U	2	10
Chloroform	01	3/11/98		ug/L	U	2	5
Chloromethane	01	3/11/98		ug/L	U	2	10
Chrysene	01	3/11/98		ug/L	U	2	10
cis-1,2-Dichloroethene	01	3/11/98		ug/L	U	2	5
cis-1,3-Dichloropropene	01	3/11/98		ug/L	U	2	5
Delta-BHC	01	3/11/98		ug/L	U	0.05	0.05
Dibenzo(a,h)anthracene	01	3/11/98		ug/L	U	2	10
Dibenzofuran	01	3/11/98		ug/L	U	2	10
Dibromochloromethane	01	3/11/98		ug/L	U	2	5
Dibromomethane	01	3/11/98		ug/L	U	2	5
Dichlorodifluoromethane	01	3/11/98		ug/L	U	2	5
Dieldrin	01	3/11/98		ug/L	U	0.1	0.1
Diethylphthalate	01	3/11/98		ug/L	U	2	10

**Volatile Organics**

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PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 105 of 159

PW5-18D

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Dimethyl phthalate							
01	3/11/98		ug/L	U		2	10
Di-n-butylphthalate							
01	3/11/98		ug/L	U		2	10
di-n-octyl phthalate							
01	3/11/98		ug/L	U		2	10
Endosulfan I							
01	3/11/98		ug/L	U		0.05	0.05
Endosulfan II							
01	3/11/98		ug/L	U		0.1	0.1
Endosulfan Sulfate							
01	3/11/98		ug/L	U		0.1	0.1
Endrin							
01	3/11/98		ug/L	U		0.1	0.1
Endrin Aldehyde							
01	3/11/98		ug/L	U		0.1	0.1
Endrin Ketone							
01	3/11/98		ug/L	U		0.1	0.1
Ethylbenzene							
01	3/11/98		ug/L	U		2	5
Fluoranthene							
01	3/11/98		ug/L	U		2	10
Fluorene							
01	3/11/98		ug/L	U		2	10
Gamma-BHC							
01	3/11/98		ug/L	U		0.05	0.05
Heptachlor							
01	3/11/98		ug/L	U		0.05	0.05
Heptachlor Epoxide							
01	3/11/98		ug/L	U		0.05	0.05
Hexachlorobenzene							
01	3/11/98		ug/L	U		2	10

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachlorobutadiene							
01	3/11/98		ug/L	U		2	10
01	3/11/98		ug/L	U		2	5
Hexachlorocyclopentadiene							
01	3/11/98		ug/L	U		2	10
Hexachloroethane							
01	3/11/98		ug/L	U		2	10
Indeno(1,2,3-cd)pyrene							
01	3/11/98		ug/L	U		2	10
Isophorone							
01	3/11/98		ug/L	U		2	10
Isopropylbenzene							
01	3/11/98		ug/L	U		2	5
Methoxychlor							
01	3/11/98		ug/L	U		0.5	0.5
Methylene Chloride							
01	3/11/98		ug/L	U		2	5
Naphthalene							
01	3/11/98		ug/L	U		2	5
01	3/11/98		ug/L	U		2	10
n-Butylbenzene							
01	3/11/98		ug/L	U		2	5
Nitrobenzene							
01	3/11/98		ug/L	U		2	10
n-Nitrosodimethylamine							
01	3/11/98		ug/L	U		2	10
n-Nitroso-di-n-propylamine							
01	3/11/98		ug/L	U		2	10
n-Nitrosodiphenylamine							
01	3/11/98		ug/L	U		2	10
n-Propylbenzene							
01	3/11/98		ug/L	U		2	5
Pentachlorophenol							
01	3/11/98		ug/L	U		10	50

## Volatile Organics

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MDL = Method Detection Limit

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Phenanthrene	01	3/11/98		ug/L	U	2	10
Phenol	01	3/11/98		ug/L	U	2	10
Pyrene	01	3/11/98		ug/L	U	2	10
sec-Butylbenzene	01	3/11/98		ug/L	U	2	5
Styrene	01	3/11/98		ug/L	U	2	5
tert-Butylbenzene	01	3/11/98		ug/L	U	2	5
Tetrachloroethene	01	3/11/98	2.3	ug/L	J	2	5
Toluene	01	3/11/98		ug/L	U	2	5
Toxaphene	01	3/11/98		ug/L	U	1	1
trans-1,2-Dichloroethene	01	3/11/98		ug/L	U	2	5
trans-1,3-Dichloropropene	01	3/11/98		ug/L	U	2	5
Trichloroethene	01	3/11/98	2.2	ug/L	J	2	5
Trichlorofluoromethane	01	3/11/98		ug/L	U	2	5
Vinyl Acetate	01	3/11/98		ug/L	U	2	10
Vinyl Chloride	01	3/11/98		ug/L	U	2	10
Xylenes (Total)	01	3/11/98		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
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**Volatile Organics****Qualifiers = (Based on EPA CLP 3/90)**

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B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-1D</b>							
1,1,1,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/10/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/10/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/10/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/10/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/10/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
1,2-Dichloroethane	13	2/10/99		ug/L	U	2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
<b>1,3-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
<b>2,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	10	50
<b>2-Butanone</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chloronaphthalene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	13	2/10/99		ug/L	U	2	10

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PQL = Practical Quantitation Limit

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Page 108 of 159

PW5-1D

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/10/99		ug/L	U	2	5
2-Hexanone	13	2/10/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/10/99		ug/L	U	2	10
2-Methylphenol	13	2/10/99		ug/L	U	2	10
2-Nitroaniline	13	2/10/99		ug/L	U	10	50
2-Nitrophenol	13	2/10/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/10/99		ug/L	U	4	20
3-Nitroaniline	13	2/10/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/10/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/10/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/10/99		ug/L	U	2	10
4-Chloroaniline	13	2/10/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/10/99		ug/L	U	2	10
4-Chlorotoluene	13	2/10/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/10/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/10/99		ug/L	U	2	10
4-Methylphenol	13	2/10/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/10/99		ug/L	U	10	50
4-Nitrophenol	13	2/10/99		ug/L	U	10	50
Acenaphthene	13	2/10/99		ug/L	U	2	10
Acenaphthylene	13	2/10/99		ug/L	U	2	10
Acetone	13	2/10/99	3.9	ug/L	J	2	10
Acrylonitrile	13	2/10/99		ug/L	U	2	10
Anthracene	13	2/10/99		ug/L	U	2	10
Azobenzene	13	2/10/99		ug/L	U	10	50
Benzene	13	2/10/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/10/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/10/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/10/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/10/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/10/99		ug/L	U	2	10
Benzoic Acid	13	2/10/99		ug/L	U	10	50
Benzyl Alcohol	13	2/10/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

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Page 109 of 159

**PW5-1D**

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/10/99		ug/L	U	2	10
Bromobenzene	13	2/10/99		ug/L	U	2	5
Bromochloromethane	13	2/10/99		ug/L	U	2	5
Bromodichloromethane	13	2/10/99		ug/L	U	2	5
Bromoform	13	2/10/99		ug/L	U	2	5
Bromomethane	13	2/10/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/10/99		ug/L	U	2	10
Carbon Disulfide	13	2/10/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/10/99		ug/L	U	2	5
Chlorobenzene	13	2/10/99		ug/L	U	2	5
Chloroethane	13	2/10/99		ug/L	U	2	10
Chloroform	13	2/10/99		ug/L	U	2	5
Chloromethane	13	2/10/99		ug/L	U	2	10
Chrysene	13	2/10/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/10/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/10/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/10/99		ug/L	U	2	10
Dibenzofuran	13	2/10/99		ug/L	U	2	10
Dibromochloromethane	13	2/10/99		ug/L	U	2	5
Dibromomethane	13	2/10/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/10/99		ug/L	U	2	5
Diethylphthalate	13	2/10/99		ug/L	U	2	10
Dimethyl phthalate	13	2/10/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/10/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/10/99		ug/L	U	2	10
Ethylbenzene	13	2/10/99		ug/L	U	2	5
Fluoranthene	13	2/10/99		ug/L	U	2	10
Fluorene	13	2/10/99		ug/L	U	2	10
Hexachlorobenzene	13	2/10/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

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Page 110 of 159

PW5-1D

Well ID:								Well ID:							
Analyte	Round	Date	Results	Units	Flag	MDL	PQL	Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/10/99		ug/L	U	2	10	sec-Butylbenzene	13	2/10/99		ug/L	U	2	5
Indeno(1,2,3-cd)pyrene	13	2/10/99		ug/L	U	2	10	Styrene	13	2/10/99		ug/L	U	2	5
Isophorone	13	2/10/99		ug/L	U	2	10	tert-Butylbenzene	13	2/10/99		ug/L	U	2	5
Isopropylbenzene	13	2/10/99		ug/L	U	2	5	Tetrachloroethene	13	2/10/99		ug/L	U	2	5
Methylene Chloride	13	2/10/99		ug/L	U	2	5	Toluene	13	2/10/99		ug/L	U	2	5
Naphthalene	13	2/10/99		ug/L	U	2	5	trans-1,2-Dichloroethene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10	trans-1,3-Dichloropropene	13	2/10/99		ug/L	U	2	5
n-Butylbenzene	13	2/10/99		ug/L	U	2	5	Trichloroethene	13	2/10/99		ug/L	U	2	5
Nitrobenzene	13	2/10/99		ug/L	U	2	10	Trichlorofluoromethane	13	2/10/99		ug/L	U	2	5
n-Nitrosodimethylamine	13	2/10/99		ug/L	U	2	10	Vinyl Chloride	13	2/10/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/10/99		ug/L	U	2	10	Xylenes (Total)	13	2/10/99		ug/L	U	2	5
n-Nitrosodiphenylamine	13	2/10/99		ug/L	U	2	10								
n-Propylbenzene	13	2/10/99		ug/L	U	2	5								
Pentachlorophenol	13	2/10/99		ug/L	U	10	50								
Phenanthrene	13	2/10/99		ug/L	U	2	10								
Phenol	13	2/10/99		ug/L	U	2	10								
Pyrene	13	2/10/99		ug/L	U	2	10								

#### Volatile Organics

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Page 111 of 159

PW5-1D

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-2</b>							
1,1,1,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/10/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/10/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/10/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/10/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/10/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,2-Dichloroethane	13	2/10/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
1,2-Dichloropropane	13	2/10/99		ug/L	U	2	5
1,3,5-Trimethylbenzene	13	2/10/99		ug/L	U	2	5
1,3-Dichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,3-Dichloropropane	13	2/10/99		ug/L	U	2	5
1,4-Dichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
2,2-Dichloropropane	13	2/10/99		ug/L	U	2	5
2,4,5-Trichlorophenol	13	2/10/99		ug/L	U	10	50
2,4,6-Trichlorophenol	13	2/10/99		ug/L	U	2	10
2,4-Dichlorophenol	13	2/10/99		ug/L	U	2	10
2,4-Dimethylphenol	13	2/10/99		ug/L	U	2	10
2,4-Dinitrophenol	13	2/10/99		ug/L	U	10	50
2,4-Dinitrotoluene	13	2/10/99		ug/L	U	2	10
2,6-Dinitrotoluene	13	2/10/99		ug/L	U	10	50
2-Butanone	13	2/10/99		ug/L	U	2	10
2-Chloronaphthalene	13	2/10/99		ug/L	U	2	10
2-Chlorophenol	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 112 of 159

**PW5-2**



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/10/99		ug/L	U	2	5
2-Hexanone	13	2/10/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/10/99		ug/L	U	2	10
2-Methylphenol	13	2/10/99		ug/L	U	2	10
2-Nitroaniline	13	2/10/99		ug/L	U	10	50
2-Nitrophenol	13	2/10/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/10/99		ug/L	U	4	20
3-Nitroaniline	13	2/10/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/10/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/10/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/10/99		ug/L	U	2	10
4-Chloroaniline	13	2/10/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/10/99		ug/L	U	2	10
4-Chlorotoluene	13	2/10/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/10/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/10/99		ug/L	U	2	10
4-Methylphenol	13	2/10/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/10/99		ug/L	U	10	50
4-Nitrophenol	13	2/10/99		ug/L	U	10	50
Acenaphthene	13	2/10/99		ug/L	U	2	10
Acenaphthylene	13	2/10/99		ug/L	U	2	10
Acetone	13	2/10/99		ug/L	U	2	10
Acrylonitrile	13	2/10/99		ug/L	U	2	10
Anthracene	13	2/10/99		ug/L	U	2	10
Azobenzene	13	2/10/99		ug/L	U	10	50
Benzene	13	2/10/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/10/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/10/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/10/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/10/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/10/99		ug/L	U	2	10
Benzoic Acid	13	2/10/99		ug/L	U	10	50
Benzyl Alcohol	13	2/10/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/10/99		ug/L	U	2	10
Bromobenzene	13	2/10/99		ug/L	U	2	5
Bromochloromethane	13	2/10/99		ug/L	U	2	5
Bromodichloromethane	13	2/10/99		ug/L	U	2	5
Bromoform	13	2/10/99		ug/L	U	2	5
Bromomethane	13	2/10/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/10/99		ug/L	U	2	10
Carbon Disulfide	13	2/10/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/10/99		ug/L	U	2	5
Chlorobenzene	13	2/10/99		ug/L	U	2	5
Chloroethane	13	2/10/99		ug/L	U	2	10
Chloroform	13	2/10/99		ug/L	U	2	5
Chloromethane	13	2/10/99		ug/L	U	2	10
Chrysene	13	2/10/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/10/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/10/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/10/99		ug/L	U	2	10
Dibenzofuran	13	2/10/99		ug/L	U	2	10
Dibromochloromethane	13	2/10/99		ug/L	U	2	5
Dibromomethane	13	2/10/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/10/99		ug/L	U	2	5
Diethylphthalate	13	2/10/99		ug/L	U	2	10
Dimethyl phthalate	13	2/10/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/10/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/10/99		ug/L	U	2	10
Ethylbenzene	13	2/10/99		ug/L	U	2	5
Fluoranthene	13	2/10/99		ug/L	U	2	10
Fluorene	13	2/10/99		ug/L	U	2	10
Hexachlorobenzene	13	2/10/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
Hexachlorocyclopentadiene	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 114 of 159

PW5-2

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/10/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/10/99		ug/L	U	2	10
Isophorone	13	2/10/99		ug/L	U	2	10
Isopropylbenzene	13	2/10/99		ug/L	U	2	5
Methylene Chloride	13	2/10/99		ug/L	U	2	5
Naphthalene	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
n-Butylbenzene	13	2/10/99		ug/L	U	2	5
Nitrobenzene	13	2/10/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/10/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/10/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/10/99		ug/L	U	2	10
n-Propylbenzene	13	2/10/99		ug/L	U	2	5
Pentachlorophenol	13	2/10/99		ug/L	U	10	50
Phenanthrene	13	2/10/99		ug/L	U	2	10
Phenol	13	2/10/99		ug/L	U	2	10
Pyrene	13	2/10/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/10/99		ug/L	U	2	5
Styrene	13	2/10/99		ug/L	U	2	5
tert-Butylbenzene	13	2/10/99		ug/L	U	2	5
Tetrachloroethene	13	2/10/99		ug/L	U	2	5
Toluene	13	2/10/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/10/99		ug/L	U	2	5
trans-1,3-Dichloropropene	13	2/10/99		ug/L	U	2	5
Trichloroethene	13	2/10/99		ug/L	U	2	5
Trichlorofluoromethane	13	2/10/99		ug/L	U	2	5
Vinyl Chloride	13	2/10/99		ug/L	U	2	10
Xylenes (Total)	13	2/10/99		ug/L	U	2	5

**Volatile Organics**

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B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-3</b>							
1,1,1,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/10/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/10/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/10/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/10/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/10/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,2-Dichloroethane	13	2/10/99		ug/L	U	2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
<b>1,3-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
<b>2,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	10	50
<b>2-Butanone</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chloronaphthalene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 116 of 159

PW5-3

Well ID:									Well ID:								
Analyte	Round	Date	Results	Units	Flag	MDL	PQL		Analyte	Round	Date	Results	Units	Flag	MDL	PQL	
2-Chlorotoluene	13	2/10/99		ug/L	U	2	5		4-Nitroaniline	13	2/10/99		ug/L	U	10	50	
2-Hexanone	13	2/10/99		ug/L	U	2	10		4-Nitrophenol	13	2/10/99		ug/L	U	10	50	
2-Methylnaphthalene	13	2/10/99		ug/L	U	2	10		Acenaphthene	13	2/10/99		ug/L	U	2	10	
2-Methylphenol	13	2/10/99		ug/L	U	2	10		Acenaphthylene	13	2/10/99		ug/L	U	2	10	
2-Nitroaniline	13	2/10/99		ug/L	U	10	50		Acetone	13	2/10/99		ug/L	U	2	10	
2-Nitrophenol	13	2/10/99		ug/L	U	2	10		Acrylonitrile	13	2/10/99		ug/L	U	2	10	
3,3-Dichlorobenzidine	13	2/10/99		ug/L	U	4	20		Anthracene	13	2/10/99		ug/L	U	2	10	
3-Nitroaniline	13	2/10/99		ug/L	U	10	50		Azobenzene	13	2/10/99		ug/L	U	10	50	
4,6-Dinitro-2-methylphenol	13	2/10/99		ug/L	U	10	50		Benzene	13	2/10/99		ug/L	U	2	5	
4-Bromophenyl-phenylether	13	2/10/99		ug/L	U	2	10		Benzo(a)anthracene	13	2/10/99		ug/L	U	2	10	
4-Chloro-3-methylphenol	13	2/10/99		ug/L	U	2	10		Benzo(a)pyrene	13	2/10/99		ug/L	U	2	10	
4-Chloroaniline	13	2/10/99		ug/L	U	2	10		Benzo(b)fluoranthene	13	2/10/99		ug/L	U	2	10	
4-Chlorophenyl-phenylether	13	2/10/99		ug/L	U	2	10		Benzo(g,h,i)perylene	13	2/10/99		ug/L	U	2	10	
4-Chlorotoluene	13	2/10/99		ug/L	U	2	5		Benzo(k)fluoranthene	13	2/10/99		ug/L	U	2	10	
4-Isopropyltoluene	13	2/10/99		ug/L	U	2	5		Benzoic Acid	13	2/10/99		ug/L	U	10	50	
4-Methyl-2-Pentanone	13	2/10/99		ug/L	U	2	10		Benzyl Alcohol	13	2/10/99		ug/L	U	2	10	
4-Methylphenol	13	2/10/99		ug/L	U	2	10		Bis(2-chloroethoxy)methane	13	2/10/99		ug/L	U	2	10	

#### Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 117 of 159

PW5-3

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/10/99		ug/L	U	2	10
Bromobenzene	13	2/10/99		ug/L	U	2	5
Bromochloromethane	13	2/10/99		ug/L	U	2	5
Bromodichloromethane	13	2/10/99		ug/L	U	2	5
Bromoform	13	2/10/99		ug/L	U	2	5
Bromomethane	13	2/10/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/10/99		ug/L	U	2	10
Carbon Disulfide	13	2/10/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/10/99		ug/L	U	2	5
Chlorobenzene	13	2/10/99		ug/L	U	2	5
Chloroethane	13	2/10/99		ug/L	U	2	10
Chloroform	13	2/10/99		ug/L	U	2	5
Chloromethane	13	2/10/99		ug/L	U	2	10
Chrysene	13	2/10/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/10/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/10/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/10/99		ug/L	U	2	10
Dibenzofuran	13	2/10/99		ug/L	U	2	10
Dibromochloromethane	13	2/10/99		ug/L	U	2	5
Dibromomethane	13	2/10/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/10/99		ug/L	U	2	5
Diethylphthalate	13	2/10/99		ug/L	U	2	10
Dimethyl phthalate	13	2/10/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/10/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/10/99		ug/L	U	2	10
Ethylbenzene	13	2/10/99		ug/L	U	2	5
Fluoranthene	13	2/10/99		ug/L	U	2	10
Fluorene	13	2/10/99		ug/L	U	2	10
Hexachlorobenzene	13	2/10/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U = analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 118 of 159

PW5-3

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/10/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/10/99		ug/L	U	2	10
Isophorone	13	2/10/99		ug/L	U	2	10
Isopropylbenzene	13	2/10/99		ug/L	U	2	5
Methylene Chloride	13	2/10/99		ug/L	U	2	5
Naphthalene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
n-Butylbenzene	13	2/10/99		ug/L	U	2	5
Nitrobenzene	13	2/10/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/10/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/10/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/10/99		ug/L	U	2	10
n-Propylbenzene	13	2/10/99		ug/L	U	2	5
Pentachlorophenol	13	2/10/99		ug/L	U	10	50
Phenanthrene	13	2/10/99		ug/L	U	2	10
Phenol	13	2/10/99		ug/L	U	2	10
Pyrene	13	2/10/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/10/99		ug/L	U	2	5
Styrene	13	2/10/99		ug/L	U	2	5
tert-Butylbenzene	13	2/10/99		ug/L	U	2	5
Tetrachloroethene	13	2/10/99		ug/L	U	2	5
Toluene	13	2/10/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/10/99		ug/L	U	2	5
trans-1,3-Dichloropropene	13	2/10/99		ug/L	U	2	5
Trichloroethene	13	2/10/99		ug/L	U	2	5
Trichlorofluoromethane	13	2/10/99		ug/L	U	2	5
Vinyl Chloride	13	2/10/99		ug/L	U	2	10
Xylenes (Total)	13	2/10/99		ug/L	U	2	5

**Volatile Organics**

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MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 119 of 159

PW5-3

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-4</b>							
1,1,1,2-Tetrachloroethane							
13	2/11/99		ug/L	U		2	5
1,1,1-Trichloroethane							
13	2/11/99		ug/L	U		2	5
1,1,2,2-Tetrachloroethane							
13	2/11/99		ug/L	U		2	5
1,1,2-Trichloroethane							
13	2/11/99		ug/L	U		2	5
1,1-Dichloroethane							
13	2/11/99		ug/L	U		2	5
1,1-Dichloroethene							
13	2/11/99		ug/L	U		2	5
1,1-Dichloropropene							
13	2/11/99		ug/L	U		2	5
1,2,3-Trichlorobenzene							
13	2/11/99		ug/L	U		2	5
1,2,3-Trichloropropane							
13	2/11/99		ug/L	U		2	5
1,2,4-Trichlorobenzene							
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		4	20
1,2,4-Trimethylbenzene							
13	2/11/99		ug/L	U		2	5
1,2-Dibromo-3-chloropropane							
13	2/11/99		ug/L	U		2	5
1,2-Dibromoethane							
13	2/11/99		ug/L	U		2	5
1,2-Dichlorobenzene							
13	2/11/99		ug/L	U		4	20
13	2/11/99		ug/L	U		2	5
1,2-Dichloroethane							
13	2/11/99		ug/L	U		2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
13	2/11/99		ug/L	U		2	5
<b>1,3,5-Trimethylbenzene</b>							
13	2/11/99		ug/L	U		2	5
<b>1,3-Dichlorobenzene</b>							
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		4	20
<b>1,3-Dichloropropane</b>							
13	2/11/99		ug/L	U		2	5
<b>1,4-Dichlorobenzene</b>							
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		4	20
<b>2,2-Dichloropropane</b>							
13	2/11/99		ug/L	U		2	5
<b>2,4,5-Trichlorophenol</b>							
13	2/11/99		ug/L	U		20	100
<b>2,4,6-Trichlorophenol</b>							
13	2/11/99		ug/L	U		4	20
<b>2,4-Dichlorophenol</b>							
13	2/11/99		ug/L	U		4	20
<b>2,4-Dimethylphenol</b>							
13	2/11/99		ug/L	U		4	20
<b>2,4-Dinitrophenol</b>							
13	2/11/99		ug/L	U		20	100
<b>2,4-Dinitrotoluene</b>							
13	2/11/99		ug/L	U		4	20
<b>2,6-Dinitrotoluene</b>							
13	2/11/99		ug/L	U		20	100
<b>2-Butanone</b>							
13	2/11/99		ug/L	U		2	10
<b>2-Chloronaphthalene</b>							
13	2/11/99		ug/L	U		4	20
<b>2-Chlorophenol</b>							
13	2/11/99		ug/L	U		4	20

## Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Page 120 of 159

PW5-4



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/11/99		ug/L	U	2	5
2-Hexanone	13	2/11/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/11/99		ug/L	U	4	20
2-Methylphenol	13	2/11/99		ug/L	U	4	20
2-Nitroaniline	13	2/11/99		ug/L	U	20	100
2-Nitrophenol	13	2/11/99		ug/L	U	4	20
3,3-Dichlorobenzidine	13	2/11/99		ug/L	U	8	40
3-Nitroaniline	13	2/11/99		ug/L	U	20	100
4,6-Dinitro-2-methylphenol	13	2/11/99		ug/L	U	20	100
4-Bromophenyl-phenylether	13	2/11/99		ug/L	U	4	20
4-Chloro-3-methylphenol	13	2/11/99		ug/L	U	4	20
4-Chloroaniline	13	2/11/99		ug/L	U	4	20
4-Chlorophenyl-phenylether	13	2/11/99		ug/L	U	4	20
4-Chlorotoluene	13	2/11/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/11/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/11/99		ug/L	U	2	10
4-Methylphenol	13	2/11/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/11/99		ug/L	U	20	100
4-Nitrophenol	13	2/11/99		ug/L	U	20	100
Acenaphthene	13	2/11/99		ug/L	U	4	20
Acenaphthylene	13	2/11/99		ug/L	U	4	20
Acetone	13	2/11/99	38	ug/L		2	10
Acrylonitrile	13	2/11/99		ug/L	U	2	10
Anthracene	13	2/11/99		ug/L	U	4	20
Azobenzene	13	2/11/99		ug/L	U	20	100
Benzene	13	2/11/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/11/99		ug/L	U	4	20
Benzo(a)pyrene	13	2/11/99		ug/L	U	4	20
Benzo(b)fluoranthene	13	2/11/99		ug/L	U	4	20
Benzo(g,h,i)perylene	13	2/11/99		ug/L	U	4	20
Benzo(k)fluoranthene	13	2/11/99		ug/L	U	4	20
Benzoic Acid	13	2/11/99		ug/L	U	20	100
Benzyl Alcohol	13	2/11/99		ug/L	U	4	20
Bis(2-chloroethoxy)methane	13	2/11/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/11/99		ug/L	U	4	20
bis(2-Chloroisopropyl) Ether	13	2/11/99		ug/L	U	4	20
bis(2-ethylhexyl)phthalate	13	2/11/99		ug/L	U	4	20
Bromobenzene	13	2/11/99		ug/L	U	2	5
Bromochloromethane	13	2/11/99	3.3	ug/L	J	2	5
Bromodichloromethane	13	2/11/99	13	ug/L		2	5
Bromoform	13	2/11/99		ug/L	U	2	5
Bromomethane	13	2/11/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/11/99		ug/L	U	4	20
Carbon Disulfide	13	2/11/99	7.1	ug/L		2	5
Carbon Tetrachloride	13	2/11/99		ug/L	U	2	5
Chlorobenzene	13	2/11/99		ug/L	U	2	5
Chloroethane	13	2/11/99		ug/L	U	2	10
Chloroform	13	2/11/99	180	ug/L		2	5
Chloromethane	13	2/11/99	7.5	ug/L	J	2	10
Chrysene	13	2/11/99		ug/L	U	4	20
cis-1,2-Dichloroethene	13	2/11/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/11/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/11/99		ug/L	U	4	20
Dibenzofuran	13	2/11/99		ug/L	U	4	20
Dibromochloromethane	13	2/11/99	2.8	ug/L	J	2	5
Dibromomethane	13	2/11/99	4.5	ug/L	J	2	5
Dichlorodifluoromethane	13	2/11/99		ug/L	U	2	5
Diethylphthalate	13	2/11/99		ug/L	U	4	20
Dimethyl phthalate	13	2/11/99		ug/L	U	4	20
Di-n-butylphthalate	13	2/11/99		ug/L	U	4	20
di-n-octyl phthalate	13	2/11/99		ug/L	U	4	20
Ethylbenzene	13	2/11/99		ug/L	U	2	5
Fluoranthene	13	2/11/99		ug/L	U	4	20
Fluorene	13	2/11/99		ug/L	U	4	20
Hexachlorobenzene	13	2/11/99		ug/L	U	4	20
Hexachlorobutadiene	13	2/11/99		ug/L	U	2	5
	13	2/11/99		ug/L	U	4	20
Hexachlorocyclopentadiene	13	2/11/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 122 of 159

PW5-4

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/11/99		ug/L	U	4	20
Indeno(1,2,3-cd)pyrene	13	2/11/99		ug/L	U	4	20
Isophorone	13	2/11/99		ug/L	U	4	20
Isopropylbenzene	13	2/11/99		ug/L	U	2	5
Methylene Chloride	13	2/11/99	6.7	ug/L		2	5
Naphthalene	13	2/11/99		ug/L	U	4	20
	13	2/11/99		ug/L	U	2	5
n-Butylbenzene	13	2/11/99		ug/L	U	2	5
Nitrobenzene	13	2/11/99		ug/L	U	4	20
n-Nitrosodimethylamine	13	2/11/99		ug/L	U	4	20
n-Nitroso-di-n-propylamine	13	2/11/99		ug/L	U	4	20
n-Nitrosodiphenylamine	13	2/11/99		ug/L	U	4	20
n-Propylbenzene	13	2/11/99		ug/L	U	2	5
Pentachlorophenol	13	2/11/99		ug/L	U	20	100
Phenanthrene	13	2/11/99		ug/L	U	4	20
Phenol	13	2/11/99		ug/L	U	4	20
Pyrene	13	2/11/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/11/99		ug/L	U	2	5
Styrene	13	2/11/99		ug/L	U	2	5
tert-Butylbenzene	13	2/11/99		ug/L	U	2	5
Tetrachloroethene	13	2/11/99		ug/L	U	2	5
Toluene	13	2/11/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/11/99		ug/L	U	2	5
trans-1,3-Dichloropropene	13	2/11/99		ug/L	U	2	5
Trichloroethene	13	2/11/99	3	ug/L	J	2	5
Trichlorofluoromethane	13	2/11/99		ug/L	U	2	5
Vinyl Chloride	13	2/11/99		ug/L	U	2	10
Xylenes (Total)	13	2/11/99		ug/L	U	2	5

**Volatile Organics**

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PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 123 of 159

PW5-4

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-6</b>							
1,1,1,2-Tetrachloroethane	13	2/11/99		ug/L	U	10	25
1,1,1-Trichloroethane	13	2/11/99		ug/L	U	10	25
1,1,2,2-Tetrachloroethane	13	2/11/99		ug/L	U	10	25
1,1,2-Trichloroethane	13	2/11/99		ug/L	U	10	25
1,1-Dichloroethane	13	2/11/99		ug/L	U	10	25
1,1-Dichloroethene	13	2/11/99		ug/L	U	10	25
1,1-Dichloropropene	13	2/11/99		ug/L	U	10	25
1,2,3-Trichlorobenzene	13	2/11/99		ug/L	U	10	25
1,2,3-Trichloropropane	13	2/11/99		ug/L	U	10	25
1,2,4-Trichlorobenzene	13	2/11/99		ug/L	U	10	25
	13	2/11/99		ug/L	U	4	20
1,2,4-Trimethylbenzene	13	2/11/99		ug/L	U	10	25
1,2-Dibromo-3-chloropropane	13	2/11/99		ug/L	U	10	25
1,2-Dibromoethane	13	2/11/99		ug/L	U	10	25
1,2-Dichlorobenzene	13	2/11/99		ug/L	U	10	25
	13	2/11/99		ug/L	U	4	20
1,2-Dichloroethane	13	2/11/99		ug/L	U	10	25

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
1,2-Dichloropropane	13	2/11/99		ug/L	U	10	25
1,3,5-Trimethylbenzene	13	2/11/99		ug/L	U	10	25
1,3-Dichlorobenzene	13	2/11/99		ug/L	U	10	25
	13	2/11/99		ug/L	U	4	20
1,3-Dichloropropane	13	2/11/99		ug/L	U	10	25
1,4-Dichlorobenzene	13	2/11/99		ug/L	U	10	25
	13	2/11/99		ug/L	U	4	20
2,2-Dichloropropane	13	2/11/99		ug/L	U	10	25
2,4,5-Trichlorophenol	13	2/11/99		ug/L	U	20	100
2,4,6-Trichlorophenol	13	2/11/99		ug/L	U	4	20
2,4-Dichlorophenol	13	2/11/99		ug/L	U	4	20
2,4-Dimethylphenol	13	2/11/99		ug/L	U	4	20
2,4-Dinitrophenol	13	2/11/99		ug/L	U	20	100
2,4-Dinitrotoluene	13	2/11/99		ug/L	U	4	20
2,6-Dinitrotoluene	13	2/11/99		ug/L	U	20	100
2-Butanone	13	2/11/99	200	ug/L		10	50
2-Chloronaphthalene	13	2/11/99		ug/L	U	4	20
2-Chlorophenol	13	2/11/99		ug/L	U	4	20

**Volatile Organics**

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PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/11/99		ug/L	U	10	25
2-Hexanone	13	2/11/99		ug/L	U	10	50
2-Methylnaphthalene	13	2/11/99		ug/L	U	4	20
2-Methylphenol	13	2/11/99		ug/L	U	4	20
2-Nitroaniline	13	2/11/99		ug/L	U	20	100
2-Nitrophenol	13	2/11/99		ug/L	U	4	20
3,3-Dichlorobenzidine	13	2/11/99		ug/L	U	8	40
3-Nitroaniline	13	2/11/99		ug/L	U	20	100
4,6-Dinitro-2-methylphenol	13	2/11/99		ug/L	U	20	100
4-Bromophenyl-phenylether	13	2/11/99		ug/L	U	4	20
4-Chloro-3-methylphenol	13	2/11/99		ug/L	U	4	20
4-Chloroaniline	13	2/11/99		ug/L	U	4	20
4-Chlorophenyl-phenylether	13	2/11/99		ug/L	U	4	20
4-Chlorotoluene	13	2/11/99		ug/L	U	10	25
4-Isopropyltoluene	13	2/11/99		ug/L	U	10	25
4-Methyl-2-Pentanone	13	2/11/99		ug/L	U	10	50
4-Methylphenol	13	2/11/99		ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/11/99		ug/L	U	20	100
4-Nitrophenol	13	2/11/99		ug/L	U	20	100
Acenaphthene	13	2/11/99		ug/L	U	4	20
Acenaphthylene	13	2/11/99		ug/L	U	4	20
Acetone	13	2/11/99	330	ug/L		10	50
Acrylonitrile	13	2/11/99		ug/L	U	10	50
Anthracene	13	2/11/99		ug/L	U	4	20
Azobenzene	13	2/11/99		ug/L	U	20	100
Benzene	13	2/11/99		ug/L	U	10	25
Benzo(a)anthracene	13	2/11/99		ug/L	U	4	20
Benzo(a)pyrene	13	2/11/99		ug/L	U	4	20
Benzo(b)fluoranthene	13	2/11/99		ug/L	U	4	20
Benzo(g,h,i)perylene	13	2/11/99		ug/L	U	4	20
Benzo(k)fluoranthene	13	2/11/99		ug/L	U	4	20
Benzoic Acid	13	2/11/99		ug/L	U	20	100
Benzyl Alcohol	13	2/11/99		ug/L	U	4	20
Bis(2-chloroethoxy)methane	13	2/11/99		ug/L	U	4	20

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

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J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

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If no value is listed under results, analyte was not detected at or above the MDL

Page 125 of 159

PW5-6

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/11/99		ug/L	U	4	20
bis(2-Chloroisopropyl) Ether	13	2/11/99		ug/L	U	4	20
bis(2-ethylhexyl)phthalate	13	2/11/99		ug/L	U	4	20
Bromobenzene	13	2/11/99		ug/L	U	10	25
Bromochloromethane	13	2/11/99		ug/L	U	10	25
Bromodichloromethane	13	2/11/99	660	ug/L		10	25
Bromoform	13	2/11/99	110	ug/L		10	25
Bromomethane	13	2/11/99		ug/L	U	10	50
Butylbenzylphthalate	13	2/11/99		ug/L	U	4	20
Carbon Disulfide	13	2/11/99	210	ug/L		10	25
Carbon Tetrachloride	13	2/11/99		ug/L	U	10	25
Chlorobenzene	13	2/11/99		ug/L	U	10	25
Chloroethane	13	2/11/99		ug/L	U	10	50
Chloroform	13	2/11/99	7500	ug/L		200	500
Chloromethane	13	2/11/99	140	ug/L		10	50
Chrysene	13	2/11/99		ug/L	U	4	20
cis-1,2-Dichloroethene	13	2/11/99		ug/L	U	10	25

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/11/99		ug/L	U	10	25
Dibenzo(a,h)anthracene	13	2/11/99		ug/L	U	4	20
Dibenzofuran	13	2/11/99		ug/L	U	4	20
Dibromochloromethane	13	2/11/99	280	ug/L		10	25
Dibromomethane	13	2/11/99	20	ug/L	J	10	25
Dichlorodifluoromethane	13	2/11/99		ug/L	U	10	25
Diethylphthalate	13	2/11/99		ug/L	U	4	20
Dimethyl phthalate	13	2/11/99		ug/L	U	4	20
Di-n-butylphthalate	13	2/11/99		ug/L	U	4	20
di-n-octyl phthalate	13	2/11/99		ug/L	U	4	20
Ethylbenzene	13	2/11/99		ug/L	U	10	25
Fluoranthene	13	2/11/99		ug/L	U	4	20
Fluorene	13	2/11/99		ug/L	U	4	20
Hexachlorobenzene	13	2/11/99		ug/L	U	4	20
Hexachlorobutadiene	13	2/11/99		ug/L	U	10	25
	13	2/11/99		ug/L	U	4	20
Hexachlorocyclopentadiene	13	2/11/99		ug/L	U	4	20

## Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Hexachloroethane</b>							
13	2/11/99			ug/L	U	4	20
<b>Indeno(1,2,3-cd)pyrene</b>							
13	2/11/99			ug/L	U	4	20
<b>Isophorone</b>							
13	2/11/99			ug/L	U	4	20
<b>Isopropylbenzene</b>							
13	2/11/99			ug/L	U	10	25
<b>Methylene Chloride</b>							
13	2/11/99	140		ug/L		10	25
<b>Naphthalene</b>							
13	2/11/99			ug/L	U	4	20
13	2/11/99			ug/L	U	10	25
<b>n-Butylbenzene</b>							
13	2/11/99			ug/L	U	10	25
<b>Nitrobenzene</b>							
13	2/11/99			ug/L	U	4	20
<b>n-Nitrosodimethylamine</b>							
13	2/11/99			ug/L	U	4	20
<b>n-Nitroso-di-n-propylamine</b>							
13	2/11/99			ug/L	U	4	20
<b>n-Nitrosodiphenylamine</b>							
13	2/11/99			ug/L	U	4	20
<b>n-Propylbenzene</b>							
13	2/11/99			ug/L	U	10	25
<b>Pentachlorophenol</b>							
13	2/11/99			ug/L	U	20	100
<b>Phenanthrene</b>							
13	2/11/99			ug/L	U	4	20
<b>Phenol</b>							
13	2/11/99			ug/L	U	4	20
<b>Pyrene</b>							
13	2/11/99			ug/L	U	4	20

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>sec-Butylbenzene</b>							
13	2/11/99			ug/L	U	10	25
<b>Styrene</b>							
13	2/11/99			ug/L	U	10	25
<b>tert-Butylbenzene</b>							
13	2/11/99			ug/L	U	10	25
<b>Tetrachloroethene</b>							
13	2/11/99			ug/L	U	10	25
<b>Toluene</b>							
13	2/11/99			ug/L	U	10	25
<b>trans-1,2-Dichloroethene</b>							
13	2/11/99			ug/L	U	10	25
<b>trans-1,3-Dichloropropene</b>							
13	2/11/99			ug/L	U	10	25
<b>Trichloroethene</b>							
13	2/11/99			ug/L	U	10	25
<b>Trichlorofluoromethane</b>							
13	2/11/99			ug/L	U	10	25
<b>Vinyl Chloride</b>							
13	2/11/99	14		ug/L	J	10	50
<b>Xylenes (Total)</b>							
13	2/11/99			ug/L	U	10	25

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-7</b>							
1,1,1,2-Tetrachloroethane	13	2/9/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/9/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/9/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/9/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/9/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/9/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/9/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/9/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/9/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/9/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/9/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/9/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
1,2-Dichloroethane	13	2/9/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/9/99		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	13	2/9/99		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
<b>1,3-Dichloropropane</b>							
	13	2/9/99		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
<b>2,2-Dichloropropane</b>							
	13	2/9/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	13	2/9/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	13	2/9/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	13	2/9/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	13	2/9/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	13	2/9/99		ug/L	U	10	50
<b>2-Butanone</b>							
	13	2/9/99		ug/L	U	2	10
<b>2-Chloronaphthalene</b>							
	13	2/9/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	13	2/9/99		ug/L	U	2	10

**Volatile Organics**

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MDL = Method Detection Limit

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If no value is listed under results, analyte was not detected at or above the MDL

Page 128 of 159

PW5-7



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/9/99		ug/L	U	2	5
2-Hexanone	13	2/9/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/9/99		ug/L	U	2	10
2-Methylphenol	13	2/9/99		ug/L	U	2	10
2-Nitroaniline	13	2/9/99		ug/L	U	10	50
2-Nitrophenol	13	2/9/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/9/99		ug/L	U	4	20
3-Nitroaniline	13	2/9/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/9/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/9/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/9/99		ug/L	U	2	10
4-Chloroaniline	13	2/9/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/9/99		ug/L	U	2	10
4-Chlorotoluene	13	2/9/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/9/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/9/99		ug/L	U	2	10
4-Methylphenol	13	2/9/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/9/99		ug/L	U	10	50
4-Nitrophenol	13	2/9/99		ug/L	U	10	50
Acenaphthene	13	2/9/99		ug/L	U	2	10
Acenaphthylene	13	2/9/99		ug/L	U	2	10
Acetone	13	2/9/99	7	ug/L	JB	2	10
Acrylonitrile	13	2/9/99		ug/L	U	2	10
Anthracene	13	2/9/99		ug/L	U	2	10
Azobenzene	13	2/9/99		ug/L	U	10	50
Benzene	13	2/9/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/9/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/9/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/9/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/9/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/9/99		ug/L	U	2	10
Benzoic Acid	13	2/9/99		ug/L	U	10	50
Benzyl Alcohol	13	2/9/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/9/99		ug/L	U	2	10

**Volatile Organics**

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/9/99		ug/L	U	2	10
Bromobenzene	13	2/9/99		ug/L	U	2	5
Bromochloromethane	13	2/9/99		ug/L	U	2	5
Bromodichloromethane	13	2/9/99		ug/L	U	2	5
Bromoform	13	2/9/99		ug/L	U	2	5
Bromomethane	13	2/9/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/9/99		ug/L	U	2	10
Carbon Disulfide	13	2/9/99	9.3	ug/L		2	5
Carbon Tetrachloride	13	2/9/99		ug/L	U	2	5
Chlorobenzene	13	2/9/99		ug/L	U	2	5
Chloroethane	13	2/9/99		ug/L	U	2	10
Chloroform	13	2/9/99	26	ug/L		2	5
Chloromethane	13	2/9/99		ug/L	U	2	10
Chrysene	13	2/9/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/9/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/9/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/9/99		ug/L	U	2	10
Dibenzofuran	13	2/9/99		ug/L	U	2	10
Dibromochloromethane	13	2/9/99		ug/L	U	2	5
Dibromomethane	13	2/9/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/9/99		ug/L	U	2	5
Diethylphthalate	13	2/9/99		ug/L	U	2	10
Dimethyl phthalate	13	2/9/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/9/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/9/99		ug/L	U	2	10
Ethylbenzene	13	2/9/99		ug/L	U	2	5
Fluoranthene	13	2/9/99		ug/L	U	2	10
Fluorene	13	2/9/99		ug/L	U	2	10
Hexachlorobenzene	13	2/9/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/9/99		ug/L	U	2	10
	13	2/9/99		ug/L	U	2	5
Hexachlorocyclopentadiene	13	2/9/99		ug/L	U	2	10

**Volatile Organics**

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PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 130 of 159

PW5-7

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Hexachloroethane</b>							
13	2/9/99		ug/L	U		2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
13	2/9/99		ug/L	U		2	10
<b>Isophorone</b>							
13	2/9/99		ug/L	U		2	10
<b>Isopropylbenzene</b>							
13	2/9/99		ug/L	U		2	5
<b>Methylene Chloride</b>							
13	2/9/99		ug/L	U		2	5
<b>Naphthalene</b>							
13	2/9/99		ug/L	U		2	5
13	2/9/99		ug/L	U		2	10
<b>n-Butylbenzene</b>							
13	2/9/99		ug/L	U		2	5
<b>Nitrobenzene</b>							
13	2/9/99		ug/L	U		2	10
<b>n-Nitrosodimethylamine</b>							
13	2/9/99		ug/L	U		2	10
<b>n-Nitroso-di-n-propylamine</b>							
13	2/9/99		ug/L	U		2	10
<b>n-Nitrosodiphenylamine</b>							
13	2/9/99		ug/L	U		2	10
<b>n-Propylbenzene</b>							
13	2/9/99		ug/L	U		2	5
<b>Pentachlorophenol</b>							
13	2/9/99		ug/L	U		10	50
<b>Phenanthrene</b>							
13	2/9/99		ug/L	U		2	10
<b>Phenol</b>							
13	2/9/99		ug/L	U		2	10
<b>Pyrene</b>							
13	2/9/99		ug/L	U		2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>sec-Butylbenzene</b>							
13	2/9/99		ug/L	U		2	5
<b>Styrene</b>							
13	2/9/99		ug/L	U		2	5
<b>tert-Butylbenzene</b>							
13	2/9/99		ug/L	U		2	5
<b>Tetrachloroethene</b>							
13	2/9/99	26	ug/L			2	5
<b>Toluene</b>							
13	2/9/99		ug/L	U		2	5
<b>trans-1,2-Dichloroethene</b>							
13	2/9/99		ug/L	U		2	5
<b>trans-1,3-Dichloropropene</b>							
13	2/9/99		ug/L	U		2	5
<b>Trichloroethene</b>							
13	2/9/99	14	ug/L			2	5
<b>Trichlorofluoromethane</b>							
13	2/9/99		ug/L	U		2	5
<b>Vinyl Chloride</b>							
13	2/9/99		ug/L	U		2	10
<b>Xylenes (Total)</b>							
13	2/9/99		ug/L	U		2	5

**Volatile Organics**

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-8</b>							
1,1,1,2-Tetrachloroethane							
13	2/9/99		ug/L	U		20	50
1,1,1-Trichloroethane							
13	2/9/99		ug/L	U		20	50
1,1,2,2-Tetrachloroethane							
13	2/9/99		ug/L	U		20	50
1,1,2-Trichloroethane							
13	2/9/99		ug/L	U		20	50
1,1-Dichloroethane							
13	2/9/99		ug/L	U		20	50
1,1-Dichloroethene							
13	2/9/99		ug/L	U		20	50
1,1-Dichloropropene							
13	2/9/99		ug/L	U		20	50
1,2,3-Trichlorobenzene							
13	2/9/99		ug/L	U		20	50
1,2,3-Trichloropropane							
13	2/9/99		ug/L	U		20	50
1,2,4-Trichlorobenzene							
13	2/9/99		ug/L	U		20	50
13	2/9/99		ug/L	U		2	10
1,2,4-Trimethylbenzene							
13	2/9/99		ug/L	U		20	50
1,2-Dibromo-3-chloropropane							
13	2/9/99		ug/L	U		20	50
1,2-Dibromoethane							
13	2/9/99		ug/L	U		20	50
1,2-Dichlorobenzene							
13	2/9/99		ug/L	U		20	50
13	2/9/99		ug/L	U		2	10
1,2-Dichloroethane							
13	2/9/99		ug/L	U		20	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
13	2/9/99		ug/L	U		20	50
<b>1,3,5-Trimethylbenzene</b>							
13	2/9/99		ug/L	U		20	50
<b>1,3-Dichlorobenzene</b>							
13	2/9/99		ug/L	U		20	50
13	2/9/99		ug/L	U		2	10
<b>1,3-Dichloropropane</b>							
13	2/9/99		ug/L	U		20	50
<b>1,4-Dichlorobenzene</b>							
13	2/9/99		ug/L	U		2	10
13	2/9/99		ug/L	U		20	50
<b>2,2-Dichloropropane</b>							
13	2/9/99		ug/L	U		20	50
<b>2,4,5-Trichlorophenol</b>							
13	2/9/99		ug/L	U		10	50
<b>2,4,6-Trichlorophenol</b>							
13	2/9/99		ug/L	U		2	10
<b>2,4-Dichlorophenol</b>							
13	2/9/99		ug/L	U		2	10
<b>2,4-Dimethylphenol</b>							
13	2/9/99		ug/L	U		2	10
<b>2,4-Dinitrophenol</b>							
13	2/9/99		ug/L	U		10	50
<b>2,4-Dinitrotoluene</b>							
13	2/9/99		ug/L	U		2	10
<b>2,6-Dinitrotoluene</b>							
13	2/9/99		ug/L	U		10	50
<b>2-Butanone</b>							
13	2/9/99		ug/L	U		20	100
<b>2-Chloronaphthalene</b>							
13	2/9/99		ug/L	U		2	10
<b>2-Chlorophenol</b>							
13	2/9/99		ug/L	U		2	10

**Volatile Organics**

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J = analyte was detected at a value between MDL and PQL

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**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/9/99		ug/L	U	20	50
2-Hexanone	13	2/9/99		ug/L	U	20	100
2-Methylnaphthalene	13	2/9/99		ug/L	U	2	10
2-Methylphenol	13	2/9/99		ug/L	U	2	10
2-Nitroaniline	13	2/9/99		ug/L	U	10	50
2-Nitrophenol	13	2/9/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/9/99		ug/L	U	4	20
3-Nitroaniline	13	2/9/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/9/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/9/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/9/99		ug/L	U	2	10
4-Chloroaniline	13	2/9/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/9/99		ug/L	U	2	10
4-Chlorotoluene	13	2/9/99		ug/L	U	20	50
4-Isopropyltoluene	13	2/9/99		ug/L	U	20	50
4-Methyl-2-Pentanone	13	2/9/99		ug/L	U	20	100
4-Methylphenol	13	2/9/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/9/99		ug/L	U	10	50
4-Nitrophenol	13	2/9/99		ug/L	U	10	50
Acenaphthene	13	2/9/99		ug/L	U	2	10
Acenaphthylene	13	2/9/99		ug/L	U	2	10
Acetone	13	2/9/99		ug/L	U	20	100
Acrylonitrile	13	2/9/99		ug/L	U	20	100
Anthracene	13	2/9/99		ug/L	U	2	10
Azobenzene	13	2/9/99		ug/L	U	10	50
Benzene	13	2/9/99		ug/L	U	20	50
Benzo(a)anthracene	13	2/9/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/9/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/9/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/9/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/9/99		ug/L	U	2	10
Benzoic Acid	13	2/9/99		ug/L	U	10	50
Benzyl Alcohol	13	2/9/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/9/99		ug/L	U	2	10

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PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/9/99	29	ug/L	B	2	10
Bromobenzene	13	2/9/99		ug/L	U	20	50
Bromochloromethane	13	2/9/99		ug/L	U	20	50
Bromodichloromethane	13	2/9/99	58	ug/L		20	50
Bromoform	13	2/9/99		ug/L	U	20	50
Bromomethane	13	2/9/99		ug/L	U	20	100
Butylbenzylphthalate	13	2/9/99		ug/L	U	2	10
Carbon Disulfide	13	2/9/99		ug/L	U	20	50
Carbon Tetrachloride	13	2/9/99		ug/L	U	20	50
Chlorobenzene	13	2/9/99		ug/L	U	20	50
Chloroethane	13	2/9/99		ug/L	U	20	100
Chloroform	13	2/9/99	250	ug/L		20	50
Chloromethane	13	2/9/99		ug/L	U	20	100
Chrysene	13	2/9/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/9/99		ug/L	U	20	50

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/9/99		ug/L	U	20	50
Dibenzo(a,h)anthracene	13	2/9/99		ug/L	U	2	10
Dibenzofuran	13	2/9/99		ug/L	U	2	10
Dibromochloromethane	13	2/9/99		ug/L	U	20	50
Dibromomethane	13	2/9/99		ug/L	U	20	50
Dichlorodifluoromethane	13	2/9/99		ug/L	U	20	50
Diethylphthalate	13	2/9/99		ug/L	U	2	10
Dimethyl phthalate	13	2/9/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/9/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/9/99		ug/L	U	2	10
Ethylbenzene	13	2/9/99		ug/L	U	20	50
Fluoranthene	13	2/9/99		ug/L	U	2	10
Fluorene	13	2/9/99		ug/L	U	2	10
Hexachlorobenzene	13	2/9/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/9/99		ug/L	U	2	10
	13	2/9/99		ug/L	U	20	50
Hexachlorocyclopentadiene	13	2/9/99		ug/L	U	2	10

## Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 134 of 159

PW5-8

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/9/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/9/99		ug/L	U	2	10
Isophorone	13	2/9/99		ug/L	U	2	10
Isopropylbenzene	13	2/9/99		ug/L	U	20	50
Methylene Chloride	13	2/9/99	25	ug/L	J	20	50
Naphthalene	13	2/9/99		ug/L	U	2	10
	13	2/9/99		ug/L	U	20	50
n-Butylbenzene	13	2/9/99		ug/L	U	20	50
Nitrobenzene	13	2/9/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/9/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/9/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/9/99		ug/L	U	2	10
n-Propylbenzene	13	2/9/99		ug/L	U	20	50
Pentachlorophenol	13	2/9/99		ug/L	U	10	50
Phenanthrene	13	2/9/99		ug/L	U	2	10
Phenol	13	2/9/99		ug/L	U	2	10
Pyrene	13	2/9/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/9/99		ug/L	U	20	50
Styrene	13	2/9/99		ug/L	U	20	50
tert-Butylbenzene	13	2/9/99		ug/L	U	20	50
Tetrachloroethene	13	2/9/99	1800	ug/L		20	50
Toluene	13	2/9/99		ug/L	U	20	50
trans-1,2-Dichloroethene	13	2/9/99		ug/L	U	20	50
trans-1,3-Dichloropropene	13	2/9/99		ug/L	U	20	50
Trichloroethene	13	2/9/99	66	ug/L		20	50
Trichlorofluoromethane	13	2/9/99		ug/L	U	20	50
Vinyl Chloride	13	2/9/99		ug/L	U	20	100
Xylenes (Total)	13	2/9/99		ug/L	U	20	50

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 135 of 159

PW5-8

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>PW5-9</b>							
1,1,1,2-Tetrachloroethane							
13	2/9/99		ug/L	U		2	5
1,1,1-Trichloroethane							
13	2/9/99		ug/L	U		2	5
1,1,2,2-Tetrachloroethane							
13	2/9/99		ug/L	U		2	5
1,1,2-Trichloroethane							
13	2/9/99		ug/L	U		2	5
1,1-Dichloroethane							
13	2/9/99		ug/L	U		2	5
1,1-Dichloroethene							
13	2/9/99		ug/L	U		2	5
1,1-Dichloropropene							
13	2/9/99		ug/L	U		2	5
1,2,3-Trichlorobenzene							
13	2/9/99		ug/L	U		2	5
1,2,3-Trichloropropane							
13	2/9/99		ug/L	U		2	5
1,2,4-Trichlorobenzene							
13	2/9/99		ug/L	U		2	10
13	2/9/99		ug/L	U		2	5
1,2,4-Trimethylbenzene							
13	2/9/99		ug/L	U		2	5
1,2-Dibromo-3-chloropropane							
13	2/9/99		ug/L	U		2	5
1,2-Dibromoethane							
13	2/9/99		ug/L	U		2	5
1,2-Dichlorobenzene							
13	2/9/99		ug/L	U		2	5
13	2/9/99		ug/L	U		2	10
1,2-Dichloroethane							
13	2/9/99		ug/L	U		2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
13	2/9/99		ug/L	U		2	5
<b>1,3,5-Trimethylbenzene</b>							
13	2/9/99		ug/L	U		2	5
<b>1,3-Dichlorobenzene</b>							
13	2/9/99		ug/L	U		2	10
13	2/9/99		ug/L	U		2	5
<b>1,3-Dichloropropane</b>							
13	2/9/99		ug/L	U		2	5
<b>1,4-Dichlorobenzene</b>							
13	2/9/99		ug/L	U		2	5
13	2/9/99		ug/L	U		2	10
<b>2,2-Dichloropropane</b>							
13	2/9/99		ug/L	U		2	5
<b>2,4,5-Trichlorophenol</b>							
13	2/9/99		ug/L	U		10	50
<b>2,4,6-Trichlorophenol</b>							
13	2/9/99		ug/L	U		2	10
<b>2,4-Dichlorophenol</b>							
13	2/9/99		ug/L	U		2	10
<b>2,4-Dimethylphenol</b>							
13	2/9/99		ug/L	U		2	10
<b>2,4-Dinitrophenol</b>							
13	2/9/99		ug/L	U		10	50
<b>2,4-Dinitrotoluene</b>							
13	2/9/99		ug/L	U		2	10
<b>2,6-Dinitrotoluene</b>							
13	2/9/99		ug/L	U		10	50
<b>2-Butanone</b>							
13	2/9/99		ug/L	U		2	10
<b>2-Chloronaphthalene</b>							
13	2/9/99		ug/L	U		2	10
<b>2-Chlorophenol</b>							
13	2/9/99		ug/L	U		2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 136 of 159

PW5-9



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/9/99		ug/L	U	2	5
2-Hexanone	13	2/9/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/9/99		ug/L	U	2	10
2-Methylphenol	13	2/9/99		ug/L	U	2	10
2-Nitroaniline	13	2/9/99		ug/L	U	10	50
2-Nitrophenol	13	2/9/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/9/99		ug/L	U	4	20
3-Nitroaniline	13	2/9/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/9/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/9/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/9/99		ug/L	U	2	10
4-Chloroaniline	13	2/9/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/9/99		ug/L	U	2	10
4-Chlorotoluene	13	2/9/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/9/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/9/99		ug/L	U	2	10
4-Methylphenol	13	2/9/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/9/99		ug/L	U	10	50
4-Nitrophenol	13	2/9/99		ug/L	U	10	50
Acenaphthene	13	2/9/99		ug/L	U	2	10
Acenaphthylene	13	2/9/99		ug/L	U	2	10
Acetone	13	2/9/99		ug/L	U	2	10
Acrylonitrile	13	2/9/99		ug/L	U	2	10
Anthracene	13	2/9/99		ug/L	U	2	10
Azobenzene	13	2/9/99		ug/L	U	10	50
Benzene	13	2/9/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/9/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/9/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/9/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/9/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/9/99		ug/L	U	2	10
Benzoic Acid	13	2/9/99		ug/L	U	10	50
Benzyl Alcohol	13	2/9/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/9/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/9/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/9/99	23	ug/L	B	2	10
Bromobenzene	13	2/9/99		ug/L	U	2	5
Bromochloromethane	13	2/9/99		ug/L	U	2	5
Bromodichloromethane	13	2/9/99		ug/L	U	2	5
Bromoform	13	2/9/99		ug/L	U	2	5
Bromomethane	13	2/9/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/9/99		ug/L	U	2	10
Carbon Disulfide	13	2/9/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/9/99		ug/L	U	2	5
Chlorobenzene	13	2/9/99		ug/L	U	2	5
Chloroethane	13	2/9/99		ug/L	U	2	10
Chloroform	13	2/9/99		ug/L	U	2	5
Chloromethane	13	2/9/99		ug/L	U	2	10
Chrysene	13	2/9/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/9/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/9/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/9/99		ug/L	U	2	10
Dibenzofuran	13	2/9/99		ug/L	U	2	10
Dibromochloromethane	13	2/9/99		ug/L	U	2	5
Dibromomethane	13	2/9/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/9/99		ug/L	U	2	5
Diethylphthalate	13	2/9/99		ug/L	U	2	10
Dimethyl phthalate	13	2/9/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/9/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/9/99		ug/L	U	2	10
Ethylbenzene	13	2/9/99		ug/L	U	2	5
Fluoranthene	13	2/9/99		ug/L	U	2	10
Fluorene	13	2/9/99		ug/L	U	2	10
Hexachlorobenzene	13	2/9/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/9/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/9/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/9/99		ug/L	U	2	10
Isophorone	13	2/9/99		ug/L	U	2	10
Isopropylbenzene	13	2/9/99		ug/L	U	2	5
Methylene Chloride	13	2/9/99		ug/L	U	2	5
Naphthalene	13	2/9/99		ug/L	U	2	5
	13	2/9/99		ug/L	U	2	10
n-Butylbenzene	13	2/9/99		ug/L	U	2	5
Nitrobenzene	13	2/9/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/9/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/9/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/9/99		ug/L	U	2	10
n-Propylbenzene	13	2/9/99		ug/L	U	2	5
Pentachlorophenol	13	2/9/99		ug/L	U	10	50
Phenanthrene	13	2/9/99		ug/L	U	2	10
Phenol	13	2/9/99		ug/L	U	2	10
Pyrene	13	2/9/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/9/99		ug/L	U	2	5
Styrene	13	2/9/99		ug/L	U	2	5
tert-Butylbenzene	13	2/9/99		ug/L	U	2	5
Tetrachloroethene	13	2/9/99		ug/L	U	2	5
Toluene	13	2/9/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/9/99		ug/L	U	2	5
trans-1,3-Dichloropropene	13	2/9/99		ug/L	U	2	5
Trichloroethene	13	2/9/99		ug/L	U	2	5
Trichlorofluoromethane	13	2/9/99		ug/L	U	2	5
Vinyl Chloride	13	2/9/99		ug/L	U	2	10
Xylenes (Total)	13	2/9/99		ug/L	U	2	5

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U = analyte was not detected at the indicated MD

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J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>SW5-1</b>							
1,1,1,2-Tetrachloroethane	13	2/10/99		ug/L	U	20	50
1,1,1-Trichloroethane	13	2/10/99		ug/L	U	20	50
1,1,2,2-Tetrachloroethane	13	2/10/99		ug/L	U	20	50
1,1,2-Trichloroethane	13	2/10/99		ug/L	U	20	50
1,1-Dichloroethane	13	2/10/99		ug/L	U	20	50
1,1-Dichloroethene	13	2/10/99		ug/L	U	20	50
1,1-Dichloropropene	13	2/10/99		ug/L	U	20	50
1,2,3-Trichlorobenzene	13	2/10/99		ug/L	U	20	50
1,2,3-Trichloropropane	13	2/10/99		ug/L	U	20	50
1,2,4-Trichlorobenzene	13	2/10/99		ug/L	U	20	50
	13	2/10/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/10/99		ug/L	U	20	50
1,2-Dibromo-3-chloropropane	13	2/10/99		ug/L	U	20	50
1,2-Dibromoethane	13	2/10/99		ug/L	U	20	50
1,2-Dichlorobenzene	13	2/10/99		ug/L	U	20	50
	13	2/10/99		ug/L	U	2	10
1,2-Dichloroethane	13	2/10/99		ug/L	U	20	50

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	20	50
<b>1,3,5-Trimethylbenzene</b>							
	13	2/10/99		ug/L	U	20	50
<b>1,3-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	20	50
	13	2/10/99		ug/L	U	2	10
<b>1,3-Dichloropropane</b>							
	13	2/10/99		ug/L	U	20	50
<b>1,4-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	20	50
<b>2,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	20	50
<b>2,4,5-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	10	50
<b>2-Butanone</b>							
	13	2/10/99		ug/L	U	20	100
<b>2-Chloronaphthalene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

Well ID:									Well ID:								
Analyte	Round	Date	Results	Units	Flag	MDL	PQL		Analyte	Round	Date	Results	Units	Flag	MDL	PQL	
2-Chlorotoluene	13	2/10/99		ug/L	U	20	50		4-Nitroaniline	13	2/10/99		ug/L	U	10	50	
2-Hexanone	13	2/10/99		ug/L	U	20	100		4-Nitrophenol	13	2/10/99		ug/L	U	10	50	
2-Methylnaphthalene	13	2/10/99		ug/L	U	2	10		Acenaphthene	13	2/10/99		ug/L	U	2	10	
2-Methylphenol	13	2/10/99		ug/L	U	2	10		Acenaphthylene	13	2/10/99		ug/L	U	2	10	
2-Nitroaniline	13	2/10/99		ug/L	U	10	50		Acetone	13	2/10/99	1200	ug/L		20	100	
2-Nitrophenol	13	2/10/99		ug/L	U	2	10		Acrylonitrile	13	2/10/99		ug/L	U	20	100	
3,3-Dichlorobenzidine	13	2/10/99		ug/L	U	4	20		Anthracene	13	2/10/99		ug/L	U	2	10	
3-Nitroaniline	13	2/10/99		ug/L	U	10	50		Azobenzene	13	2/10/99		ug/L	U	10	50	
4,6-Dinitro-2-methylphenol	13	2/10/99		ug/L	U	10	50		Benzene	13	2/10/99		ug/L	U	20	50	
4-Bromophenyl-phenylether	13	2/10/99		ug/L	U	2	10		Benzo(a)anthracene	13	2/10/99		ug/L	U	2	10	
4-Chloro-3-methylphenol	13	2/10/99		ug/L	U	2	10		Benzo(a)pyrene	13	2/10/99		ug/L	U	2	10	
4-Chloroaniline	13	2/10/99		ug/L	U	2	10		Benzo(b)fluoranthene	13	2/10/99		ug/L	U	2	10	
4-Chlorophenyl-phenylether	13	2/10/99		ug/L	U	2	10		Benzo(g,h,i)perylene	13	2/10/99		ug/L	U	2	10	
4-Chlorotoluene	13	2/10/99		ug/L	U	20	50		Benzo(k)fluoranthene	13	2/10/99		ug/L	U	2	10	
4-Isopropyltoluene	13	2/10/99		ug/L	U	20	50		Benzoic Acid	13	2/10/99		ug/L	U	10	50	
4-Methyl-2-Pentanone	13	2/10/99		ug/L	U	20	100		Benzyl Alcohol	13	2/10/99		ug/L	U	2	10	
4-Methylphenol	13	2/10/99		ug/L	U	2	10		Bis(2-chloroethoxy)methane	13	2/10/99		ug/L	U	2	10	

#### Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

U = analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/10/99		ug/L	U	2	10
Bromobenzene	13	2/10/99		ug/L	U	20	50
Bromochloromethane	13	2/10/99		ug/L	U	20	50
Bromodichloromethane	13	2/10/99		ug/L	U	20	50
Bromoform	13	2/10/99		ug/L	U	20	50
Bromomethane	13	2/10/99		ug/L	U	20	100
Butylbenzylphthalate	13	2/10/99		ug/L	U	2	10
Carbon Disulfide	13	2/10/99	27	ug/L	J	20	50
Carbon Tetrachloride	13	2/10/99		ug/L	U	20	50
Chlorobenzene	13	2/10/99		ug/L	U	20	50
Chloroethane	13	2/10/99		ug/L	U	20	100
Chloroform	13	2/10/99		ug/L	U	20	50
Chloromethane	13	2/10/99		ug/L	U	20	100
Chrysene	13	2/10/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/10/99		ug/L	U	20	50

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/10/99		ug/L	U	20	50
Dibenzo(a,h)anthracene	13	2/10/99		ug/L	U	2	10
Dibenzofuran	13	2/10/99		ug/L	U	2	10
Dibromochloromethane	13	2/10/99		ug/L	U	20	50
Dibromomethane	13	2/10/99		ug/L	U	20	50
Dichlorodifluoromethane	13	2/10/99		ug/L	U	20	50
Diethylphthalate	13	2/10/99		ug/L	U	2	10
Dimethyl phthalate	13	2/10/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/10/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/10/99		ug/L	U	2	10
Ethylbenzene	13	2/10/99		ug/L	U	20	50
Fluoranthene	13	2/10/99		ug/L	U	2	10
Fluorene	13	2/10/99		ug/L	U	2	10
Hexachlorobenzene	13	2/10/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/10/99		ug/L	U	20	50
	13	2/10/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/10/99		ug/L	U	2	10

## Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/10/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/10/99		ug/L	U	2	10
Isophorone	13	2/10/99		ug/L	U	2	10
Isopropylbenzene	13	2/10/99		ug/L	U	20	50
Methylene Chloride	13	2/10/99		ug/L	U	20	50
Naphthalene	13	2/10/99		ug/L	U	20	50
	13	2/10/99		ug/L	U	2	10
n-Butylbenzene	13	2/10/99		ug/L	U	20	50
Nitrobenzene	13	2/10/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/10/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/10/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/10/99		ug/L	U	2	10
n-Propylbenzene	13	2/10/99		ug/L	U	20	50
Pentachlorophenol	13	2/10/99		ug/L	U	10	50
Phenanthrene	13	2/10/99		ug/L	U	2	10
Phenol	13	2/10/99	27	ug/L		2	10
Pyrene	13	2/10/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/10/99		ug/L	U	20	50
Styrene	13	2/10/99		ug/L	U	20	50
tert-Butylbenzene	13	2/10/99		ug/L	U	20	50
Tetrachloroethene	13	2/10/99		ug/L	U	20	50
Toluene	13	2/10/99		ug/L	U	20	50
trans-1,2-Dichloroethene	13	2/10/99		ug/L	U	20	50
trans-1,3-Dichloropropene	13	2/10/99		ug/L	U	20	50
Trichloroethene	13	2/10/99		ug/L	U	20	50
Trichlorofluoromethane	13	2/10/99		ug/L	U	20	50
Vinyl Chloride	13	2/10/99		ug/L	U	20	100
Xylenes (Total)	13	2/10/99		ug/L	U	20	50

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 143 of 159

SW5-1

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>SW5-2</b>							
1,1,1,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,1-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1,2,2-Tetrachloroethane	13	2/10/99		ug/L	U	2	5
1,1,2-Trichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethane	13	2/10/99		ug/L	U	2	5
1,1-Dichloroethene	13	2/10/99		ug/L	U	2	5
1,1-Dichloropropene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
1,2,3-Trichloropropane	13	2/10/99		ug/L	U	2	5
1,2,4-Trichlorobenzene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
1,2,4-Trimethylbenzene	13	2/10/99		ug/L	U	2	5
1,2-Dibromo-3-chloropropane	13	2/10/99		ug/L	U	2	5
1,2-Dibromoethane	13	2/10/99		ug/L	U	2	5
1,2-Dichlorobenzene	13	2/10/99		ug/L	U	2	10
	13	2/10/99		ug/L	U	2	5
1,2-Dichloroethane	13	2/10/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,3,5-Trimethylbenzene</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,3-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
<b>1,3-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>1,4-Dichlorobenzene</b>							
	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
<b>2,2-Dichloropropane</b>							
	13	2/10/99		ug/L	U	2	5
<b>2,4,5-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4,6-Trichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dichlorophenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dimethylphenol</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,4-Dinitrophenol</b>							
	13	2/10/99		ug/L	U	10	50
<b>2,4-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2,6-Dinitrotoluene</b>							
	13	2/10/99		ug/L	U	10	50
<b>2-Butanone</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chloronaphthalene</b>							
	13	2/10/99		ug/L	U	2	10
<b>2-Chlorophenol</b>							
	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/10/99		ug/L	U	2	5
2-Hexanone	13	2/10/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/10/99		ug/L	U	2	10
2-Methylphenol	13	2/10/99		ug/L	U	2	10
2-Nitroaniline	13	2/10/99		ug/L	U	10	50
2-Nitrophenol	13	2/10/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/10/99		ug/L	U	4	20
3-Nitroaniline	13	2/10/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/10/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/10/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/10/99		ug/L	U	2	10
4-Chloroaniline	13	2/10/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/10/99		ug/L	U	2	10
4-Chlorotoluene	13	2/10/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/10/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/10/99		ug/L	U	2	10
4-Methylphenol	13	2/10/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/10/99		ug/L	U	10	50
4-Nitrophenol	13	2/10/99		ug/L	U	10	50
Acenaphthene	13	2/10/99		ug/L	U	2	10
Acenaphthylene	13	2/10/99		ug/L	U	2	10
Acetone	13	2/10/99	16	ug/L		2	10
Acrylonitrile	13	2/10/99		ug/L	U	2	10
Anthracene	13	2/10/99		ug/L	U	2	10
Azobenzene	13	2/10/99		ug/L	U	10	50
Benzene	13	2/10/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/10/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/10/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/10/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/10/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/10/99		ug/L	U	2	10
Benzoic Acid	13	2/10/99		ug/L	U	10	50
Benzyl Alcohol	13	2/10/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 145 of 159

SW5-2

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/10/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/10/99		ug/L	U	2	10
Bromobenzene	13	2/10/99		ug/L	U	2	5
Bromochloromethane	13	2/10/99		ug/L	U	2	5
Bromodichloromethane	13	2/10/99		ug/L	U	2	5
Bromoform	13	2/10/99		ug/L	U	2	5
Bromomethane	13	2/10/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/10/99		ug/L	U	2	10
Carbon Disulfide	13	2/10/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/10/99		ug/L	U	2	5
Chlorobenzene	13	2/10/99		ug/L	U	2	5
Chloroethane	13	2/10/99		ug/L	U	2	10
Chloroform	13	2/10/99		ug/L	U	2	5
Chloromethane	13	2/10/99		ug/L	U	2	10
Chrysene	13	2/10/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/10/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/10/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/10/99		ug/L	U	2	10
Dibenzofuran	13	2/10/99		ug/L	U	2	10
Dibromochloromethane	13	2/10/99		ug/L	U	2	5
Dibromomethane	13	2/10/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/10/99		ug/L	U	2	5
Diethylphthalate	13	2/10/99		ug/L	U	2	10
Dimethyl phthalate	13	2/10/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/10/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/10/99		ug/L	U	2	10
Ethylbenzene	13	2/10/99		ug/L	U	2	5
Fluoranthene	13	2/10/99		ug/L	U	2	10
Fluorene	13	2/10/99		ug/L	U	2	10
Hexachlorobenzene	13	2/10/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/10/99		ug/L	U	2	5
	13	2/10/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/10/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 146 of 159

SW5-2

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Hexachloroethane</b>							
13	2/10/99		ug/L	U		2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
13	2/10/99		ug/L	U		2	10
<b>Isophorone</b>							
13	2/10/99		ug/L	U		2	10
<b>Isopropylbenzene</b>							
13	2/10/99		ug/L	U		2	5
<b>Methylene Chloride</b>							
13	2/10/99		ug/L	U		2	5
<b>Naphthalene</b>							
13	2/10/99		ug/L	U		2	5
13	2/10/99		ug/L	U		2	10
<b>n-Butylbenzene</b>							
13	2/10/99		ug/L	U		2	5
<b>Nitrobenzene</b>							
13	2/10/99		ug/L	U		2	10
<b>n-Nitrosodimethylamine</b>							
13	2/10/99		ug/L	U		2	10
<b>n-Nitroso-di-n-propylamine</b>							
13	2/10/99		ug/L	U		2	10
<b>n-Nitrosodiphenylamine</b>							
13	2/10/99		ug/L	U		2	10
<b>n-Propylbenzene</b>							
13	2/10/99		ug/L	U		2	5
<b>Pentachlorophenol</b>							
13	2/10/99		ug/L	U		10	50
<b>Phenanthrene</b>							
13	2/10/99		ug/L	U		2	10
<b>Phenol</b>							
13	2/10/99		ug/L	U		2	10
<b>Pyrene</b>							
13	2/10/99		ug/L	U		2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>sec-Butylbenzene</b>							
13	2/10/99		ug/L	U		2	5
<b>Styrene</b>							
13	2/10/99		ug/L	U		2	5
<b>tert-Butylbenzene</b>							
13	2/10/99		ug/L	U		2	5
<b>Tetrachloroethene</b>							
13	2/10/99		ug/L	U		2	5
<b>Toluene</b>							
13	2/10/99		ug/L	U		2	5
<b>trans-1,2-Dichloroethene</b>							
13	2/10/99		ug/L	U		2	5
<b>trans-1,3-Dichloropropene</b>							
13	2/10/99		ug/L	U		2	5
<b>Trichloroethene</b>							
13	2/10/99		ug/L	U		2	5
<b>Trichlorofluoromethane</b>							
13	2/10/99		ug/L	U		2	5
<b>Vinyl Chloride</b>							
13	2/10/99		ug/L	U		2	10
<b>Xylenes (Total)</b>							
13	2/10/99		ug/L	U		2	5

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
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## SW5-3

## 1,1,1,2-Tetrachloroethane

13	2/11/99	ug/L	U	2	5
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## 1,1,1-Trichloroethane

13	2/11/99	ug/L	U	2	5
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## 1,1,2,2-Tetrachloroethane

13	2/11/99	ug/L	U	2	5
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## 1,1,2-Trichloroethane

13	2/11/99	ug/L	U	2	5
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## 1,1-Dichloroethane

13	2/11/99	ug/L	U	2	5
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## 1,1-Dichloroethene

13	2/11/99	ug/L	U	2	5
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## 1,1-Dichloropropene

13	2/11/99	ug/L	U	2	5
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## 1,2,3-Trichlorobenzene

13	2/11/99	ug/L	U	2	5
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## 1,2,3-Trichloropropane

13	2/11/99	ug/L	U	2	5
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## 1,2,4-Trichlorobenzene

13	2/11/99	ug/L	U	2	5
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13	2/11/99	ug/L	U	2	10
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## 1,2,4-Trimethylbenzene

13	2/11/99	ug/L	U	2	5
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## 1,2-Dibromo-3-chloropropane

13	2/11/99	ug/L	U	2	5
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## 1,2-Dibromoethane

13	2/11/99	ug/L	U	2	5
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## 1,2-Dichlorobenzene

13	2/11/99	ug/L	U	2	10
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13	2/11/99	ug/L	U	2	5
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## 1,2-Dichloroethane

13	2/11/99	ug/L	U	2	5
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## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
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## 1,2-Dichloropropane

13	2/11/99	ug/L	U	2	5
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## 1,3,5-Trimethylbenzene

13	2/11/99	ug/L	U	2	5
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## 1,3-Dichlorobenzene

13	2/11/99	ug/L	U	2	10
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13	2/11/99	ug/L	U	2	5
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## 1,3-Dichloropropane

13	2/11/99	ug/L	U	2	5
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## 1,4-Dichlorobenzene

13	2/11/99	ug/L	U	2	10
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13	2/11/99	ug/L	U	2	5
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## 2,2-Dichloropropane

13	2/11/99	ug/L	U	2	5
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## 2,4,5-Trichlorophenol

13	2/11/99	ug/L	U	10	50
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## 2,4,6-Trichlorophenol

13	2/11/99	ug/L	U	2	10
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## 2,4-Dichlorophenol

13	2/11/99	ug/L	U	2	10
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## 2,4-Dimethylphenol

13	2/11/99	ug/L	U	2	10
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## 2,4-Dinitrophenol

13	2/11/99	ug/L	U	10	50
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## 2,4-Dinitrotoluene

13	2/11/99	ug/L	U	2	10
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## 2,6-Dinitrotoluene

13	2/11/99	ug/L	U	10	50
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## 2-Butanone

13	2/11/99	ug/L	U	2	10
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## 2-Chloronaphthalene

13	2/11/99	ug/L	U	2	10
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## 2-Chlorophenol

13	2/11/99	ug/L	U	2	10
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## Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/11/99		ug/L	U	2	5
2-Hexanone	13	2/11/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/11/99		ug/L	U	2	10
2-Methylphenol	13	2/11/99		ug/L	U	2	10
2-Nitroaniline	13	2/11/99		ug/L	U	10	50
2-Nitrophenol	13	2/11/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/11/99		ug/L	U	4	20
3-Nitroaniline	13	2/11/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/11/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/11/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/11/99		ug/L	U	2	10
4-Chloroaniline	13	2/11/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/11/99		ug/L	U	2	10
4-Chlorotoluene	13	2/11/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/11/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/11/99		ug/L	U	2	10
4-Methylphenol	13	2/11/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/11/99		ug/L	U	10	50
4-Nitrophenol	13	2/11/99		ug/L	U	10	50
Acenaphthene	13	2/11/99		ug/L	U	2	10
Acenaphthylene	13	2/11/99		ug/L	U	2	10
Acetone	13	2/11/99		ug/L	U	2	10
Acrylonitrile	13	2/11/99		ug/L	U	2	10
Anthracene	13	2/11/99		ug/L	U	2	10
Azobenzene	13	2/11/99		ug/L	U	10	50
Benzene	13	2/11/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/11/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/11/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/11/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/11/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/11/99		ug/L	U	2	10
Benzoic Acid	13	2/11/99		ug/L	U	10	50
Benzyl Alcohol	13	2/11/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/11/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 149 of 159

SW5-3

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/11/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/11/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/11/99		ug/L	U	2	10
Bromobenzene	13	2/11/99		ug/L	U	2	5
Bromochloromethane	13	2/11/99		ug/L	U	2	5
Bromodichloromethane	13	2/11/99		ug/L	U	2	5
Bromoform	13	2/11/99		ug/L	U	2	5
Bromomethane	13	2/11/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/11/99		ug/L	U	2	10
Carbon Disulfide	13	2/11/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/11/99		ug/L	U	2	5
Chlorobenzene	13	2/11/99		ug/L	U	2	5
Chloroethane	13	2/11/99		ug/L	U	2	10
Chloroform	13	2/11/99		ug/L	U	2	5
Chloromethane	13	2/11/99		ug/L	U	2	10
Chrysene	13	2/11/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/11/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/11/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/11/99		ug/L	U	2	10
Dibenzofuran	13	2/11/99		ug/L	U	2	10
Dibromochloromethane	13	2/11/99		ug/L	U	2	5
Dibromomethane	13	2/11/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/11/99		ug/L	U	2	5
Diethylphthalate	13	2/11/99		ug/L	U	2	10
Dimethyl phthalate	13	2/11/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/11/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/11/99		ug/L	U	2	10
Ethylbenzene	13	2/11/99		ug/L	U	2	5
Fluoranthene	13	2/11/99		ug/L	U	2	10
Fluorene	13	2/11/99		ug/L	U	2	10
Hexachlorobenzene	13	2/11/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/11/99		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	5
Hexachlorocyclopentadiene	13	2/11/99		ug/L	U	2	10

**Volatile Organics**

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PQL = Practical Quantitation Limit

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Page 150 of 159

SW5-3

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>Hexachloroethane</b>							
13	2/11/99		ug/L	U		2	10
<b>Indeno(1,2,3-cd)pyrene</b>							
13	2/11/99		ug/L	U		2	10
<b>Isophorone</b>							
13	2/11/99		ug/L	U		2	10
<b>Isopropylbenzene</b>							
13	2/11/99		ug/L	U		2	5
<b>Methylene Chloride</b>							
13	2/11/99		ug/L	U		2	5
<b>Naphthalene</b>							
13	2/11/99		ug/L	U		2	10
13	2/11/99		ug/L	U		2	5
<b>n-Butylbenzene</b>							
13	2/11/99		ug/L	U		2	5
<b>Nitrobenzene</b>							
13	2/11/99		ug/L	U		2	10
<b>n-Nitrosodimethylamine</b>							
13	2/11/99		ug/L	U		2	10
<b>n-Nitroso-di-n-propylamine</b>							
13	2/11/99		ug/L	U		2	10
<b>n-Nitrosodiphenylamine</b>							
13	2/11/99		ug/L	U		2	10
<b>n-Propylbenzene</b>							
13	2/11/99		ug/L	U		2	5
<b>Pentachlorophenol</b>							
13	2/11/99		ug/L	U		10	50
<b>Phenanthrene</b>							
13	2/11/99		ug/L	U		2	10
<b>Phenol</b>							
13	2/11/99		ug/L	U		2	10
<b>Pyrene</b>							
13	2/11/99		ug/L	U		2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>sec-Butylbenzene</b>							
13	2/11/99		ug/L	U		2	5
<b>Styrene</b>							
13	2/11/99		ug/L	U		2	5
<b>tert-Butylbenzene</b>							
13	2/11/99		ug/L	U		2	5
<b>Tetrachloroethene</b>							
13	2/11/99		ug/L	U		2	5
<b>Toluene</b>							
13	2/11/99		ug/L	U		2	5
<b>trans-1,2-Dichloroethene</b>							
13	2/11/99		ug/L	U		2	5
<b>trans-1,3-Dichloropropene</b>							
13	2/11/99		ug/L	U		2	5
<b>Trichloroethene</b>							
13	2/11/99		ug/L	U		2	5
<b>Trichlorofluoromethane</b>							
13	2/11/99		ug/L	U		2	5
<b>Vinyl Chloride</b>							
13	2/11/99		ug/L	U		2	10
<b>Xylenes (Total)</b>							
13	2/11/99		ug/L	U		2	5

**Volatile Organics**

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Page 151 of 159

SW5-3

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>SW5-3D</b>							
1,1,1,2-Tetrachloroethane							
13	2/11/99		ug/L	U		2	5
1,1,1-Trichloroethane							
13	2/11/99		ug/L	U		2	5
1,1,2,2-Tetrachloroethane							
13	2/11/99		ug/L	U		2	5
1,1,2-Trichloroethane							
13	2/11/99		ug/L	U		2	5
1,1-Dichloroethane							
13	2/11/99		ug/L	U		2	5
1,1-Dichloroethene							
13	2/11/99		ug/L	U		2	5
1,1-Dichloropropene							
13	2/11/99		ug/L	U		2	5
1,2,3-Trichlorobenzene							
13	2/11/99		ug/L	U		2	5
1,2,3-Trichloropropane							
13	2/11/99		ug/L	U		2	5
1,2,4-Trichlorobenzene							
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
1,2,4-Trimethylbenzene							
13	2/11/99		ug/L	U		2	5
1,2-Dibromo-3-chloropropane							
13	2/11/99		ug/L	U		2	5
1,2-Dibromoethane							
13	2/11/99		ug/L	U		2	5
1,2-Dichlorobenzene							
13	2/11/99		ug/L	U		2	10
13	2/11/99		ug/L	U		2	5
1,2-Dichloroethane							
13	2/11/99		ug/L	U		2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>1,2-Dichloropropane</b>							
13	2/11/99		ug/L	U		2	5
<b>1,3,5-Trimethylbenzene</b>							
13	2/11/99		ug/L	U		2	5
<b>1,3-Dichlorobenzene</b>							
13	2/11/99		ug/L	U		2	10
13	2/11/99		ug/L	U		2	5
<b>1,3-Dichloropropane</b>							
13	2/11/99		ug/L	U		2	5
<b>1,4-Dichlorobenzene</b>							
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
<b>2,2-Dichloropropane</b>							
13	2/11/99		ug/L	U		2	5
<b>2,4,5-Trichlorophenol</b>							
13	2/11/99		ug/L	U		10	50
<b>2,4,6-Trichlorophenol</b>							
13	2/11/99		ug/L	U		2	10
<b>2,4-Dichlorophenol</b>							
13	2/11/99		ug/L	U		2	10
<b>2,4-Dimethylphenol</b>							
13	2/11/99		ug/L	U		2	10
<b>2,4-Dinitrophenol</b>							
13	2/11/99		ug/L	U		10	50
<b>2,4-Dinitrotoluene</b>							
13	2/11/99		ug/L	U		2	10
<b>2,6-Dinitrotoluene</b>							
13	2/11/99		ug/L	U		10	50
<b>2-Butanone</b>							
13	2/11/99		ug/L	U		2	10
<b>2-Chloronaphthalene</b>							
13	2/11/99		ug/L	U		2	10
<b>2-Chlorophenol</b>							
13	2/11/99		ug/L	U		2	10

## Volatile Organics

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MDL = Method Detection Limit

B = analyte was detected in daily method blank

PQL = Practical Quantitation Limit

J = analyte was detected at a value between MDL and PQL

If no value is listed under results, analyte was not detected at or above the MDL



**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/11/99		ug/L	U	2	5
2-Hexanone	13	2/11/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/11/99		ug/L	U	2	10
2-Methylphenol	13	2/11/99		ug/L	U	2	10
2-Nitroaniline	13	2/11/99		ug/L	U	10	50
2-Nitrophenol	13	2/11/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/11/99		ug/L	U	4	20
3-Nitroaniline	13	2/11/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/11/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/11/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/11/99		ug/L	U	2	10
4-Chloroaniline	13	2/11/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/11/99		ug/L	U	2	10
4-Chlorotoluene	13	2/11/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/11/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/11/99		ug/L	U	2	10
4-Methylphenol	13	2/11/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/11/99		ug/L	U	10	50
4-Nitrophenol	13	2/11/99		ug/L	U	10	50
Acenaphthene	13	2/11/99		ug/L	U	2	10
Acenaphthylene	13	2/11/99		ug/L	U	2	10
Acetone	13	2/11/99	5.3	ug/L	J	2	10
Acrylonitrile	13	2/11/99		ug/L	U	2	10
Anthracene	13	2/11/99		ug/L	U	2	10
Azobenzene	13	2/11/99		ug/L	U	10	50
Benzene	13	2/11/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/11/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/11/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/11/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/11/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/11/99		ug/L	U	2	10
Benzoic Acid	13	2/11/99		ug/L	U	10	50
Benzyl Alcohol	13	2/11/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/11/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 153 of 159

SW5-3D

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/11/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/11/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/11/99		ug/L	U	2	10
Bromobenzene	13	2/11/99		ug/L	U	2	5
Bromochloromethane	13	2/11/99		ug/L	U	2	5
Bromodichloromethane	13	2/11/99		ug/L	U	2	5
Bromoform	13	2/11/99		ug/L	U	2	5
Bromomethane	13	2/11/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/11/99		ug/L	U	2	10
Carbon Disulfide	13	2/11/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/11/99		ug/L	U	2	5
Chlorobenzene	13	2/11/99		ug/L	U	2	5
Chloroethane	13	2/11/99		ug/L	U	2	10
Chloroform	13	2/11/99		ug/L	U	2	5
Chloromethane	13	2/11/99		ug/L	U	2	10
Chrysene	13	2/11/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/11/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/11/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/11/99		ug/L	U	2	10
Dibenzofuran	13	2/11/99		ug/L	U	2	10
Dibromochloromethane	13	2/11/99		ug/L	U	2	5
Dibromomethane	13	2/11/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/11/99		ug/L	U	2	5
Diethylphthalate	13	2/11/99		ug/L	U	2	10
Dimethyl phthalate	13	2/11/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/11/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/11/99		ug/L	U	2	10
Ethylbenzene	13	2/11/99		ug/L	U	2	5
Fluoranthene	13	2/11/99		ug/L	U	2	10
Fluorene	13	2/11/99		ug/L	U	2	10
Hexachlorobenzene	13	2/11/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/11/99		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/11/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 154 of 159

SW5-3D

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/11/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/11/99		ug/L	U	2	10
Isophorone	13	2/11/99		ug/L	U	2	10
Isopropylbenzene	13	2/11/99		ug/L	U	2	5
Methylene Chloride	13	2/11/99		ug/L	U	2	5
Naphthalene	13	2/11/99		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	10
n-Butylbenzene	13	2/11/99		ug/L	U	2	5
Nitrobenzene	13	2/11/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/11/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/11/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/11/99		ug/L	U	2	10
n-Propylbenzene	13	2/11/99		ug/L	U	2	5
Pentachlorophenol	13	2/11/99		ug/L	U	10	50
Phenanthrene	13	2/11/99		ug/L	U	2	10
Phenol	13	2/11/99		ug/L	U	2	10
Pyrene	13	2/11/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/11/99		ug/L	U	2	5
Styrene	13	2/11/99		ug/L	U	2	5
tert-Butylbenzene	13	2/11/99		ug/L	U	2	5
Tetrachloroethene	13	2/11/99		ug/L	U	2	5
Toluene	13	2/11/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/11/99		ug/L	U	2	5
trans-1,3-Dichloropropene	13	2/11/99		ug/L	U	2	5
Trichloroethene	13	2/11/99		ug/L	U	2	5
Trichlorofluoromethane	13	2/11/99		ug/L	U	2	5
Vinyl Chloride	13	2/11/99		ug/L	U	2	10
Xylenes (Total)	13	2/11/99		ug/L	U	2	5

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 155 of 159

**SW5-3D**

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
<b>SW5-4</b>							
1,1,1,2-Tetrachloroethane							
13	2/11/99		ug/L	U		2	5
1,1,1-Trichloroethane							
13	2/11/99		ug/L	U		2	5
1,1,2,2-Tetrachloroethane							
13	2/11/99		ug/L	U		2	5
1,1,2-Trichloroethane							
13	2/11/99		ug/L	U		2	5
1,1-Dichloroethane							
13	2/11/99		ug/L	U		2	5
1,1-Dichloroethene							
13	2/11/99		ug/L	U		2	5
1,1-Dichloropropene							
13	2/11/99		ug/L	U		2	5
1,2,3-Trichlorobenzene							
13	2/11/99		ug/L	U		2	5
1,2,3-Trichloropropane							
13	2/11/99		ug/L	U		2	5
1,2,4-Trichlorobenzene							
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
1,2,4-Trimethylbenzene							
13	2/11/99		ug/L	U		2	5
1,2-Dibromo-3-chloropropane							
13	2/11/99		ug/L	U		2	5
1,2-Dibromoethane							
13	2/11/99		ug/L	U		2	5
1,2-Dichlorobenzene							
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
1,2-Dichloroethane							
13	2/11/99		ug/L	U		2	5

## Well ID:

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
1,2-Dichloropropane							
13	2/11/99		ug/L	U		2	5
1,3,5-Trimethylbenzene							
13	2/11/99		ug/L	U		2	5
1,3-Dichlorobenzene							
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
1,3-Dichloropropane							
13	2/11/99		ug/L	U		2	5
1,4-Dichlorobenzene							
13	2/11/99		ug/L	U		2	5
13	2/11/99		ug/L	U		2	10
2,2-Dichloropropane							
13	2/11/99		ug/L	U		2	5
2,4,5-Trichlorophenol							
13	2/11/99		ug/L	U		10	50
2,4,6-Trichlorophenol							
13	2/11/99		ug/L	U		2	10
2,4-Dichlorophenol							
13	2/11/99		ug/L	U		2	10
2,4-Dimethylphenol							
13	2/11/99		ug/L	U		2	10
2,4-Dinitrophenol							
13	2/11/99		ug/L	U		10	50
2,4-Dinitrotoluene							
13	2/11/99		ug/L	U		2	10
2,6-Dinitrotoluene							
13	2/11/99		ug/L	U		10	50
2-Butanone							
13	2/11/99		ug/L	U		2	10
2-Chloronaphthalene							
13	2/11/99		ug/L	U		2	10
2-Chlorophenol							
13	2/11/99		ug/L	U		2	10

## Volatile Organics

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 156 of 159

SW5-4

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
2-Chlorotoluene	13	2/11/99		ug/L	U	2	5
2-Hexanone	13	2/11/99		ug/L	U	2	10
2-Methylnaphthalene	13	2/11/99		ug/L	U	2	10
2-Methylphenol	13	2/11/99		ug/L	U	2	10
2-Nitroaniline	13	2/11/99		ug/L	U	10	50
2-Nitrophenol	13	2/11/99		ug/L	U	2	10
3,3-Dichlorobenzidine	13	2/11/99		ug/L	U	4	20
3-Nitroaniline	13	2/11/99		ug/L	U	10	50
4,6-Dinitro-2-methylphenol	13	2/11/99		ug/L	U	10	50
4-Bromophenyl-phenylether	13	2/11/99		ug/L	U	2	10
4-Chloro-3-methylphenol	13	2/11/99		ug/L	U	2	10
4-Chloroaniline	13	2/11/99		ug/L	U	2	10
4-Chlorophenyl-phenylether	13	2/11/99		ug/L	U	2	10
4-Chlorotoluene	13	2/11/99		ug/L	U	2	5
4-Isopropyltoluene	13	2/11/99		ug/L	U	2	5
4-Methyl-2-Pentanone	13	2/11/99		ug/L	U	2	10
4-Methylphenol	13	2/11/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
4-Nitroaniline	13	2/11/99		ug/L	U	10	50
4-Nitrophenol	13	2/11/99		ug/L	U	10	50
Acenaphthene	13	2/11/99		ug/L	U	2	10
Acenaphthylene	13	2/11/99		ug/L	U	2	10
Acetone	13	2/11/99	6.7	ug/L	J	2	10
Acrylonitrile	13	2/11/99		ug/L	U	2	10
Anthracene	13	2/11/99		ug/L	U	2	10
Azobenzene	13	2/11/99		ug/L	U	10	50
Benzene	13	2/11/99		ug/L	U	2	5
Benzo(a)anthracene	13	2/11/99		ug/L	U	2	10
Benzo(a)pyrene	13	2/11/99		ug/L	U	2	10
Benzo(b)fluoranthene	13	2/11/99		ug/L	U	2	10
Benzo(g,h,i)perylene	13	2/11/99		ug/L	U	2	10
Benzo(k)fluoranthene	13	2/11/99		ug/L	U	2	10
Benzoic Acid	13	2/11/99		ug/L	U	10	50
Benzyl Alcohol	13	2/11/99		ug/L	U	2	10
Bis(2-chloroethoxy)methane	13	2/11/99		ug/L	U	2	10

**Volatile Organics**

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J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
bis(2-Chloroethyl) Ether	13	2/11/99		ug/L	U	2	10
bis(2-Chloroisopropyl) Ether	13	2/11/99		ug/L	U	2	10
bis(2-ethylhexyl)phthalate	13	2/11/99		ug/L	U	2	10
Bromobenzene	13	2/11/99		ug/L	U	2	5
Bromochloromethane	13	2/11/99		ug/L	U	2	5
Bromodichloromethane	13	2/11/99		ug/L	U	2	5
Bromoform	13	2/11/99		ug/L	U	2	5
Bromomethane	13	2/11/99		ug/L	U	2	10
Butylbenzylphthalate	13	2/11/99		ug/L	U	2	10
Carbon Disulfide	13	2/11/99		ug/L	U	2	5
Carbon Tetrachloride	13	2/11/99		ug/L	U	2	5
Chlorobenzene	13	2/11/99		ug/L	U	2	5
Chloroethane	13	2/11/99		ug/L	U	2	10
Chloroform	13	2/11/99		ug/L	U	2	5
Chloromethane	13	2/11/99		ug/L	U	2	10
Chrysene	13	2/11/99		ug/L	U	2	10
cis-1,2-Dichloroethene	13	2/11/99		ug/L	U	2	5

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
cis-1,3-Dichloropropene	13	2/11/99		ug/L	U	2	5
Dibenzo(a,h)anthracene	13	2/11/99		ug/L	U	2	10
Dibenzofuran	13	2/11/99		ug/L	U	2	10
Dibromochloromethane	13	2/11/99		ug/L	U	2	5
Dibromomethane	13	2/11/99		ug/L	U	2	5
Dichlorodifluoromethane	13	2/11/99		ug/L	U	2	5
Diethylphthalate	13	2/11/99		ug/L	U	2	10
Dimethyl phthalate	13	2/11/99		ug/L	U	2	10
Di-n-butylphthalate	13	2/11/99		ug/L	U	2	10
di-n-octyl phthalate	13	2/11/99		ug/L	U	2	10
Ethylbenzene	13	2/11/99		ug/L	U	2	5
Fluoranthene	13	2/11/99		ug/L	U	2	10
Fluorene	13	2/11/99		ug/L	U	2	10
Hexachlorobenzene	13	2/11/99		ug/L	U	2	10
Hexachlorobutadiene	13	2/11/99		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	10
Hexachlorocyclopentadiene	13	2/11/99		ug/L	U	2	10

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

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B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

Page 158 of 159

SW5-4

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
Hexachloroethane	13	2/11/99		ug/L	U	2	10
Indeno(1,2,3-cd)pyrene	13	2/11/99		ug/L	U	2	10
Isophorone	13	2/11/99		ug/L	U	2	10
Isopropylbenzene	13	2/11/99		ug/L	U	2	5
Methylene Chloride	13	2/11/99		ug/L	U	2	5
Naphthalene	13	2/11/99		ug/L	U	2	5
	13	2/11/99		ug/L	U	2	10
n-Butylbenzene	13	2/11/99		ug/L	U	2	5
Nitrobenzene	13	2/11/99		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
n-Nitrosodimethylamine	13	2/11/99		ug/L	U	2	10
n-Nitroso-di-n-propylamine	13	2/11/99		ug/L	U	2	10
	13	2/11/99		ug/L	U	2	10
n-Nitrosodiphenylamine	13	2/11/99		ug/L	U	2	10
n-Propylbenzene	13	2/11/99		ug/L	U	2	5
Pentachlorophenol	13	2/11/99		ug/L	U	10	50
Phenanthrene	13	2/11/99		ug/L	U	2	10
Phenol	13	2/11/99		ug/L	U	2	10
Pyrene	13	2/11/99		ug/L	U	2	10

**Well ID:**

Analyte	Round	Date	Results	Units	Flag	MDL	PQL
sec-Butylbenzene	13	2/11/99		ug/L	U	2	5
Styrene	13	2/11/99		ug/L	U	2	5
tert-Butylbenzene	13	2/11/99		ug/L	U	2	5
Tetrachloroethene	13	2/11/99		ug/L	U	2	5
Toluene	13	2/11/99		ug/L	U	2	5
trans-1,2-Dichloroethene	13	2/11/99		ug/L	U	2	5
trans-1,3-Dichloropropene	13	2/11/99		ug/L	U	2	5
Trichloroethene	13	2/11/99		ug/L	U	2	5
Trichlorofluoromethane	13	2/11/99		ug/L	U	2	5
Vinyl Chloride	13	2/11/99		ug/L	U	2	10
Xylenes (Total)	13	2/11/99		ug/L	U	2	5

**Volatile Organics**

Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MD

B = analyte was detected in daily method blank

J = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

If no value is listed under results, analyte was not detected at or above the MDL

**APPENDIX D**

**INORGANIC SAMPLING DATA RESULTS**



# Inorganic Sampling Data By Well

## Well ID:

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>AW5-13</b>							
Cadmium, total							
13	2/12/99		0.012	mg/L	B	0.003	0.02
Chromium, total							
13	2/12/99		1.48	mg/L		0.01	0.06
Copper, total							
13	2/12/99		0.04	mg/L	B	0.01	0.06
Lead, total							
13	2/12/99			mg/L	U	0.006	0.03
Nickel, total							
13	2/12/99		0.10	mg/L		0.01	0.06
Silver, total							
13	2/12/99		0.019	mg/L	B	0.006	0.03

## AW5-20

Cadmium, total							
13	2/12/99		0.588	mg/L		0.003	0.02
Chromium, total							
13	2/12/99		14.7	mg/L		0.01	0.06
Copper, total							
13	2/12/99		1.04	mg/L		0.01	0.06
Lead, total							
13	2/12/99		0.062	mg/L		0.006	0.03
Nickel, total							
13	2/12/99		2.30	mg/L		0.01	0.06
Silver, total							
13	2/12/99		0.242	mg/L		0.006	0.03

## Well ID:

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>AW5-20D</b>							
Cadmium, total							
13	2/12/99		0.583	mg/L		0.003	0.02
Chromium, total							
13	2/12/99		14.5	mg/L		0.01	0.06
Copper, total							
13	2/12/99		1.03	mg/L		0.01	0.06
Lead, total							
13	2/12/99		0.065	mg/L		0.006	0.03
Nickel, total							
13	2/12/99		2.27	mg/L		0.01	0.06
Silver, total							
13	2/12/99		0.237	mg/L		0.006	0.03

## AW5-23

Cadmium, total							
13	2/12/99			mg/L	U	0.003	0.02
Chromium, total							
13	2/12/99		0.22	mg/L		0.01	0.06
Copper, total							
13	2/12/99			mg/L	U	0.01	0.06
Lead, total							
13	2/12/99			mg/L	U	0.006	0.03
Nickel, total							
13	2/12/99		0.05	mg/L	B	0.01	0.06
Silver, total							
13	2/12/99			mg/L	U	0.006	0.03

## Inorganics Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MDL

B = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>CW5-11</b>							
<b>Cadmium, total</b>							
13	2/12/99			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
13	2/12/99	1.21		mg/L		0.01	0.06
<b>Copper, total</b>							
13	2/12/99	0.40		mg/L		0.01	0.06
<b>Lead, total</b>							
13	2/12/99	0.017		mg/L	B	0.006	0.03
<b>Nickel, total</b>							
13	2/12/99			mg/L	U	0.01	0.06
<b>Silver, total</b>							
13	2/12/99			mg/L	U	0.006	0.03

**CW5-12**

<b>Cadmium, total</b>							
13	2/12/99	0.004		mg/L	B	0.003	0.02
<b>Chromium, total</b>							
13	2/12/99	0.72		mg/L		0.01	0.06
<b>Copper, total</b>							
13	2/12/99	0.13		mg/L		0.01	0.06
<b>Lead, total</b>							
13	2/12/99	0.016		mg/L		0.002	0.01
<b>Nickel, total</b>							
13	2/12/99	0.01		mg/L	B	0.01	0.06
<b>Silver, total</b>							
13	2/12/99			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>CW5-13</b>							
<b>Cadmium, total</b>							
13	2/12/99	0.004		mg/L	B	0.003	0.02
<b>Chromium, total</b>							
13	2/12/99	3.39		mg/L		0.01	0.06
<b>Copper, total</b>							
13	2/12/99	0.35		mg/L		0.01	0.06
<b>Lead, total</b>							
13	2/12/99	0.011		mg/L		0.002	0.01
<b>Nickel, total</b>							
13	2/12/99	0.02		mg/L	B	0.01	0.06
<b>Silver, total</b>							
13	2/12/99			mg/L	U	0.006	0.03

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

U= analyte was not detected at the indicated MDL

MDL = Method Detection Limit

B = analyte was detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>MW5-01</b>							
<b>Cadmium, total</b>							
02	4/2/98			mg/L	U	0.003	0.02
04	5/7/98			mg/L	U	0.003	0.02
06	6/10/98			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
04	5/7/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Copper, total</b>							
02	4/2/98	0.02		mg/L	B	0.01	0.06
04	5/7/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
02	4/2/98			mg/L	U	0.001	0.006
04	5/7/98			mg/L	U	0.002	0.01
06	6/10/98			mg/L	U	0.001	0.006
<b>Nickel, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
04	5/7/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Silver, total</b>							
02	4/2/98			mg/L	U	0.006	0.03
04	5/7/98			mg/L	U	0.006	0.03
06	6/10/98			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>MW5-06</b>							
<b>Cadmium, total</b>							
02	4/2/98			mg/L	U	0.02	0.08
04	5/7/98	0.004		mg/L	B	0.003	0.02
06	6/10/98			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
02	4/2/98			mg/L	U	0.05	0.3
04	5/7/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Copper, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
04	5/7/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
02	4/2/98	0.007		mg/L	B	0.002	0.01
04	5/7/98			mg/L	U	0.002	0.01
06	6/10/98			mg/L	U	0.001	0.006
<b>Nickel, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
04	5/7/98	0.01		mg/L	B	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Silver, total</b>							
02	4/2/98			mg/L	U	0.006	0.03
04	5/7/98			mg/L	U	0.006	0.03
06	6/10/98			mg/L	U	0.006	0.03

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

U= analyte was not detected at the indicated MDL

MDL = Method Detection Limit

B = analyte was detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>MW5-06D</b>							
<b>Cadmium, total</b>							
02	4/2/98			mg/L	U	0.02	0.08
<b>Chromium, total</b>							
02	4/2/98			mg/L	U	0.05	0.3
<b>Copper, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
02	4/2/98			mg/L	U	0.002	0.01
<b>Nickel, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
<b>Silver, total</b>							
02	4/2/98			mg/L	U	0.006	0.03

**MW5-1**

<b>Cadmium, total</b>							
13	2/12/99			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
13	2/12/99			mg/L	U	0.01	0.06
<b>Copper, total</b>							
13	2/12/99			mg/L	U	0.01	0.06
<b>Lead, total</b>							
13	2/12/99			mg/L	U	0.001	0.006
<b>Nickel, total</b>							
13	2/12/99	0.01		mg/L	B	0.01	0.06
<b>Silver, total</b>							
13	2/12/99			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>MW5-6</b>							
<b>Cadmium, total</b>							
13	2/12/99	0.006		mg/L	B	0.003	0.02
<b>Chromium, total</b>							
13	2/12/99			mg/L	U	0.01	0.06
<b>Copper, total</b>							
13	2/12/99			mg/L	U	0.01	0.06
<b>Lead, total</b>							
13	2/12/99	0.002		mg/L	B	0.002	0.01
<b>Nickel, total</b>							
13	2/12/99	0.01		mg/L	B	0.01	0.06
<b>Silver, total</b>							
13	2/12/99			mg/L	U	0.006	0.03

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

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MDL = Method Detection Limit

B = analyte was detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-01</b>							
<b>Cadmium, total</b>							
01	3/11/98		0.048	mg/L		0.003	0.02
02	4/1/98		0.007	mg/L	B	0.003	0.02
04	5/5/98		0.004	mg/L	B	0.003	0.02
06	6/9/98		0.004	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
01	3/11/98		0.11	mg/L		0.01	0.06
02	4/1/98		0.04	mg/L	B	0.01	0.06
04	5/5/98		0.02	mg/L	B	0.01	0.06
06	6/9/98		0.02	mg/L	B	0.01	0.06
<b>Copper, total</b>							
01	3/11/98		0.14	mg/L		0.01	0.06
02	4/1/98		0.03	mg/L	B	0.01	0.06
04	5/5/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
01	3/11/98		0.007	mg/L		0.001	0.006
02	4/1/98		0.002	mg/L	B	0.001	0.006
04	5/5/98			mg/L	U	0.001	0.005
06	6/9/98		0.002	mg/L	B	0.001	0.006
<b>Nickel, total</b>							
01	3/11/98		0.02	mg/L	B	0.01	0.06
02	4/1/98			mg/L	U	0.01	0.06
04	5/5/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
<b>Silver, total</b>							
01	3/11/98			mg/L	U	0.006	0.03
02	4/1/98			mg/L	U	0.006	0.03
04	5/5/98		0.009	mg/L	B	0.006	0.03
06	6/9/98			mg/L	U	0.006	0.03

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B = analyte was detected at a value between MDL and PQL

\*\* if no value is listed, analyte was not detected at or above MDL

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PQL = Practical Quantitation Limit

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-02</b>							
<b>Cadmium, total</b>							
01	3/11/98			mg/L	U	0.02	0.08
02	4/1/98			mg/L	U	0.003	0.02
04	5/5/98		0.005	mg/L	B	0.003	0.02
06	6/9/98		0.004	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
01	3/11/98		0.02	mg/L	B	0.01	0.06
02	4/1/98			mg/L	U	0.01	0.06
04	5/5/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
<b>Copper, total</b>							
01	3/11/98			mg/L	U	0.01	0.06
02	4/1/98			mg/L	U	0.01	0.06
04	5/5/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
01	3/11/98			mg/L	U	0.005	0.03
02	4/1/98			mg/L	U	0.001	0.006
04	5/5/98			mg/L	U	0.002	0.01
06	6/9/98		0.007	mg/L	B	0.002	0.01
<b>Nickel, total</b>							
01	3/11/98			mg/L	U	0.06	0.3
02	4/1/98			mg/L	U	0.01	0.06
04	5/5/98			mg/L	U	0.05	0.3
06	6/9/98			mg/L	U	0.01	0.06
<b>Silver, total</b>							
01	3/11/98			mg/L	U	0.006	0.03
02	4/1/98			mg/L	U	0.006	0.03
04	5/5/98			mg/L	U	0.006	0.03
06	6/9/98			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-03</b>							
Cadmium, total							
01	3/12/98			mg/L	U	0.003	0.02
Chromium, total							
01	3/12/98		0.03	mg/L	B	0.01	0.06
Copper, total							
01	3/12/98			mg/L	U	0.01	0.06
Lead, total							
01	3/12/98			mg/L	U	0.005	0.03
Nickel, total							
01	3/12/98			mg/L	U	0.06	0.3
Silver, total							
01	3/12/98		0.045	mg/L		0.006	0.03

**PW5-04**

Cadmium, total							
01	3/12/98		0.031	mg/L		0.003	0.02
Chromium, total							
01	3/12/98		0.16	mg/L		0.01	0.06
Copper, total							
01	3/12/98			mg/L	U	0.01	0.06
Lead, total							
01	3/12/98		0.006	mg/L		0.001	0.006
Nickel, total							
01	3/12/98		0.03	mg/L	B	0.01	0.06
Silver, total							
01	3/12/98			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-04D</b>							
Cadmium, total							
01	3/12/98		0.027	mg/L		0.003	0.02
Chromium, total							
01	3/12/98		0.14	mg/L		0.01	0.06
Copper, total							
01	3/12/98			mg/L	U	0.01	0.06
Lead, total							
01	3/12/98		0.004	mg/L	B	0.001	0.006
Nickel, total							
01	3/12/98		0.02	mg/L	B	0.01	0.06
Silver, total							
01	3/12/98			mg/L	U	0.006	0.03

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**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-05</b>							
<b>Cadmium, total</b>							
01	3/12/98			mg/L	U	0.003	0.02
02	4/1/98			mg/L	U	0.003	0.02
04	5/6/98	0.003		mg/L	B	0.003	0.02
06	6/9/98			mg/L	U	0.003	0.02
09	9/8/98	0.004		mg/L	B	0.003	0.02
<b>Chromium, total</b>							
01	3/12/98			mg/L	U	0.01	0.06
02	4/1/98	0.01		mg/L	B	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/9/98	0.11		mg/L		0.01	0.06
09	9/8/98	0.02		mg/L	B	0.01	0.06
<b>Copper, total</b>							
01	3/12/98			mg/L	U	0.01	0.06
02	4/1/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.02	0.1
06	6/9/98			mg/L	U	0.01	0.06
09	9/8/98	0.04		mg/L	B	0.01	0.06
<b>Lead, total</b>							
01	3/12/98			mg/L	U	0.005	0.03
02	4/1/98			mg/L	U	0.002	0.01
04	5/6/98			mg/L	U	0.002	0.01
06	6/9/98	0.003		mg/L	B	0.002	0.01
09	9/8/98			mg/L	U	0.002	0.01
<b>Nickel, total</b>							
01	3/12/98			mg/L	U	0.06	0.3
02	4/1/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
09	9/8/98			mg/L	U	0.01	0.06

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**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>Silver, total</b>							
01	3/12/98			mg/L	U	0.006	0.03
02	4/1/98			mg/L	U	0.006	0.03
04	5/6/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.006	0.03
09	9/8/98			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-06</b>							
<b>Cadmium, total</b>							
01	3/12/98		0.036	mg/L		0.003	0.02
02	4/1/98		0.019	mg/L	B	0.003	0.02
04	5/6/98		0.006	mg/L	B	0.003	0.02
06	6/9/98		0.004	mg/L	B	0.003	0.02
09	9/8/98			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
01	3/12/98		0.57	mg/L		0.01	0.06
02	4/1/98		0.38	mg/L		0.01	0.06
04	5/6/98		0.20	mg/L		0.01	0.06
06	6/9/98		0.12	mg/L		0.01	0.06
09	9/8/98		0.12	mg/L		0.01	0.06
<b>Copper, total</b>							
01	3/12/98		0.01	mg/L	B	0.01	0.06
02	4/1/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
09	9/8/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
01	3/12/98		0.004	mg/L	B	0.001	0.006
02	4/1/98		0.002	mg/L	B	0.001	0.006
04	5/6/98			mg/L	U	0.002	0.01
06	6/9/98			mg/L	U	0.001	0.006
09	9/8/98			mg/L	U	0.001	0.006
<b>Nickel, total</b>							
01	3/12/98		0.05	mg/L	B	0.01	0.06
02	4/1/98		0.02	mg/L	B	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
09	9/8/98		0.05	mg/L	B	0.01	0.06

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**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>Silver, total</b>							
01	3/12/98			mg/L	U	0.006	0.03
02	4/1/98			mg/L	U	0.006	0.03
04	5/6/98			mg/L	U	0.006	0.03
06	6/9/98			mg/L	U	0.006	0.03
09	9/8/98			mg/L	U	0.006	0.03
<b>PW5-06D</b>							
<b>Cadmium, total</b>							
04	5/6/98		0.006	mg/L	B	0.003	0.02
09	9/8/98		0.003	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
04	5/6/98		0.16	mg/L		0.01	0.06
09	9/8/98		0.12	mg/L		0.01	0.06
<b>Copper, total</b>							
04	5/6/98			mg/L	U	0.01	0.06
09	9/8/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
04	5/6/98			mg/L	U	0.002	0.01
09	9/8/98			mg/L	U	0.001	0.006
<b>Nickel, total</b>							
04	5/6/98			mg/L	U	0.01	0.06
09	9/8/98		0.06	mg/L		0.01	0.06
<b>Silver, total</b>							
04	5/6/98			mg/L	U	0.006	0.03
09	9/8/98			mg/L	U	0.006	0.03



**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-06MS</b>							
<b>Cadmium, total</b>							
04	5/6/98		0.006	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
04	5/6/98		0.15	mg/L		0.01	0.06
<b>Copper, total</b>							
04	5/6/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
04	5/6/98			mg/L	U	0.002	0.01
<b>Nickel, total</b>							
04	5/6/98			mg/L	U	0.01	0.06
<b>Silver, total</b>							
04	5/6/98			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-07</b>							
<b>Cadmium, total</b>							
01	3/12/98		0.086	mg/L		0.003	0.02
02	4/2/98		0.026	mg/L		0.003	0.02
04	5/5/98		0.007	mg/L	B	0.003	0.02
06	6/9/98		0.009	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
01	3/12/98		0.51	mg/L		0.01	0.06
02	4/2/98		0.18	mg/L		0.01	0.06
04	5/5/98		0.02	mg/L	B	0.01	0.06
06	6/9/98		0.04	mg/L	B	0.01	0.06
<b>Copper, total</b>							
01	3/12/98		0.09	mg/L		0.01	0.06
02	4/2/98		0.03	mg/L	B	0.01	0.06
04	5/5/98		0.01	mg/L	B	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
01	3/12/98		0.023	mg/L	B	0.005	0.03
02	4/2/98		0.011	mg/L		0.002	0.01
04	5/5/98			mg/L	U	0.002	0.01
06	6/9/98		0.001	mg/L	B	0.001	0.006
<b>Nickel, total</b>							
01	3/12/98		0.07	mg/L		0.01	0.06
02	4/2/98			mg/L	U	0.01	0.06
04	5/5/98			mg/L	U	0.02	0.1
06	6/9/98			mg/L	U	0.01	0.06
<b>Silver, total</b>							
01	3/12/98		0.029	mg/L	B	0.006	0.03
02	4/2/98			mg/L	U	0.006	0.03
04	5/5/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.006	0.03

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PQL = Practical Quantitation Limit

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**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-08</b>							
<b>Cadmium, total</b>							
01	3/12/98		0.013	mg/L	B	0.003	0.02
02	4/2/98		0.010	mg/L	B	0.003	0.02
04	5/6/98		0.013	mg/L	B	0.003	0.02
06	6/9/98		0.010	mg/L	B	0.003	0.02
09	9/8/98		0.019	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
01	3/12/98		1.49	mg/L		0.01	0.06
02	4/2/98		1.25	mg/L		0.01	0.06
04	5/6/98		0.26	mg/L		0.01	0.06
06	6/9/98		0.29	mg/L		0.01	0.06
09	9/8/98		0.10	mg/L		0.01	0.06
<b>Copper, total</b>							
01	3/12/98		0.08	mg/L		0.01	0.06
02	4/2/98		0.07	mg/L		0.01	0.06
04	5/6/98		0.03	mg/L	B	0.01	0.06
06	6/9/98		0.03	mg/L	B	0.01	0.06
09	9/8/98		0.19	mg/L		0.01	0.06
<b>Lead, total</b>							
01	3/12/98		0.008	mg/L	B	0.005	0.03
02	4/2/98		0.009	mg/L	B	0.002	0.01
04	5/6/98		0.003	mg/L	B	0.002	0.01
06	6/9/98		0.001	mg/L	B	0.001	0.006
09	9/8/98			mg/L	U	0.002	0.01
<b>Nickel, total</b>							
01	3/12/98		0.10	mg/L		0.01	0.06
02	4/2/98		0.08	mg/L		0.01	0.06
04	5/6/98		0.04	mg/L	B	0.01	0.06
06	6/9/98		0.03	mg/L	B	0.01	0.06
09	9/8/98		0.13	mg/L		0.01	0.06

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

U= analyte was not detected at the indicated MDL

MDL = Method Detection Limit

B = analyte was detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>Silver, total</b>							
01	3/12/98			mg/L	U	0.006	0.03
02	4/2/98			mg/L	U	0.006	0.03
04	5/6/98			mg/L	U	0.006	0.03
06	6/9/98			mg/L	U	0.006	0.03
09	9/8/98			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-09</b>							
<b>Cadmium, total</b>							
01	3/12/98			mg/L	U	0.02	0.08
02	4/1/98			mg/L	U	0.003	0.02
04	5/6/98	0.003		mg/L	B	0.003	0.02
06	6/9/98			mg/L	U	0.003	0.02
09	9/8/98			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
01	3/12/98	0.06		mg/L	B	0.06	0.3
02	4/1/98	0.01		mg/L	B	0.01	0.06
04	5/6/98	0.02		mg/L	B	0.01	0.06
06	6/9/98	0.20		mg/L		0.01	0.06
09	9/8/98	0.01		mg/L	B	0.01	0.06
<b>Copper, total</b>							
01	3/12/98			mg/L	U	0.01	0.06
02	4/1/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.02	0.1
06	6/9/98			mg/L	U	0.01	0.06
09	9/8/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
01	3/12/98	0.009		mg/L	B	0.005	0.03
02	4/1/98			mg/L	U	0.006	0.03
04	5/6/98			mg/L	U	0.002	0.01
06	6/9/98	0.004		mg/L	B	0.002	0.01
09	9/8/98			mg/L	U	0.002	0.01
<b>Nickel, total</b>							
01	3/12/98			mg/L	U	0.06	0.3
02	4/1/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
09	9/8/98			mg/L	U	0.01	0.06

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>Silver, total</b>							
01	3/12/98			mg/L	U	0.006	0.03
02	4/1/98			mg/L	U	0.006	0.03
04	5/6/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.006	0.03
09	9/8/98			mg/L	U	0.006	0.03
<b>PW5-1</b>							
<b>Cadmium, total</b>							
13	2/10/99	0.004		mg/L	B	0.003	0.02
<b>Chromium, total</b>							
13	2/10/99	0.03		mg/L	B	0.01	0.06
<b>Copper, total</b>							
13	2/10/99			mg/L	U	0.01	0.06
<b>Lead, total</b>							
13	2/10/99	0.002		mg/L	B	0.001	0.006
<b>Nickel, total</b>							
13	2/10/99			mg/L	U	0.01	0.06
<b>Silver, total</b>							
13	2/10/99			mg/L	U	0.006	0.03

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

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PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-10</b>							
<b>Cadmium, total</b>							
01	3/12/98		0.03	mg/L	B	0.02	0.08
02	4/1/98			mg/L	U	0.003	0.02
04	5/6/98		0.004	mg/L	B	0.003	0.02
06	6/9/98		0.005	mg/L	B	0.003	0.02
09	9/8/98			mg/L	U	0.07	0.3
13	2/11/99			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
01	3/12/98		0.15	mg/L	B	0.06	0.3
02	4/1/98		0.01	mg/L	B	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
09	9/8/98			mg/L	U	0.2	1
13	2/11/99			mg/L	U	0.01	0.06
<b>Copper, total</b>							
01	3/12/98			mg/L	U	0.01	0.06
02	4/1/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.02	0.1
06	6/9/98			mg/L	U	0.01	0.06
09	9/8/98			mg/L	U	0.2	1
13	2/11/99			mg/L	U	0.01	0.06
<b>Lead, total</b>							
01	3/12/98		0.007	mg/L	B	0.005	0.03
02	4/1/98			mg/L	U	0.002	0.01
04	5/6/98			mg/L	U	0.002	0.01
06	6/9/98			mg/L	U	0.002	0.01
09	9/8/98		0.006	mg/L	B	0.002	0.01
13	2/11/99			mg/L	U	0.006	0.03
<b>Nickel, total</b>							
01	3/12/98		0.03	mg/L	B	0.01	0.06

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PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
	02	4/1/98		mg/L	U	0.01	0.06
	04	5/6/98		mg/L	U	0.01	0.06
	06	6/9/98		mg/L	U	0.01	0.06
	09	9/8/98		mg/L	U	0.2	1
	13	2/11/99		mg/L	U	0.01	0.06
<b>Silver, total</b>							
	01	3/12/98		mg/L	U	0.006	0.03
	02	4/1/98		mg/L	U	0.006	0.03
	04	5/6/98		mg/L	U	0.01	0.06
	06	6/9/98		mg/L	U	0.006	0.03
	09	9/8/98		mg/L	U	0.1	0.6
	13	2/11/99		mg/L	U	0.006	0.03
<b>PW5-11</b>							
<b>Cadmium, total</b>							
	01	3/12/98		mg/L	U	0.02	0.08
	13	2/11/99	0.005	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
	01	3/12/98	0.25	mg/L		0.01	0.06
	13	2/11/99	0.08	mg/L		0.01	0.06
<b>Copper, total</b>							
	01	3/12/98	0.01	mg/L	B	0.01	0.06
	13	2/11/99		mg/L	U	0.01	0.06
<b>Lead, total</b>							
	01	3/12/98		mg/L	U	0.005	0.03
	13	2/11/99		mg/L	U	0.006	0.03
<b>Nickel, total</b>							
	01	3/12/98	0.09	mg/L		0.01	0.06
	13	2/11/99	0.08	mg/L		0.01	0.06
<b>Silver, total</b>							
	01	3/12/98		mg/L	U	0.006	0.03
	13	2/11/99		mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
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**PW5-12****Cadmium, total**

01	3/11/98	0.03	mg/L	B	0.02	0.08
13	2/10/99	0.012	mg/L	B	0.003	0.02

**Chromium, total**

01	3/11/98	0.15	mg/L	B	0.06	0.3
13	2/10/99	0.05	mg/L	B	0.01	0.06

**Copper, total**

01	3/11/98	0.04	mg/L	B	0.01	0.06
13	2/10/99	0.02	mg/L	B	0.01	0.06

**Lead, total**

01	3/11/98		mg/L	U	0.005	0.03
13	2/10/99	0.005	mg/L	B	0.004	0.02

**Nickel, total**

01	3/11/98	0.02	mg/L	B	0.01	0.06
13	2/10/99	0.01	mg/L	B	0.01	0.06

**Silver, total**

01	3/11/98	0.017	mg/L	B	0.006	0.03
13	2/10/99		mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
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**PW5-12D****Cadmium, total**

01	3/11/98	0.03	mg/L	B	0.02	0.08
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**Chromium, total**

01	3/11/98	0.14	mg/L	B	0.06	0.3
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**Copper, total**

01	3/11/98	0.04	mg/L	B	0.01	0.06
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**Lead, total**

01	3/11/98		mg/L	U	0.005	0.03
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**Nickel, total**

01	3/11/98		mg/L	U	0.06	0.3
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**Silver, total**

01	3/11/98	0.015	mg/L	B	0.006	0.03
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PQL = Practical Quantitation Limit

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**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-13</b>							
<b>Cadmium, total</b>							
01	3/11/98		0.004	mg/L	B	0.003	0.02
02	4/2/98			mg/L	U	0.02	0.08
04	5/6/98			mg/L	U	0.003	0.02
06	6/10/98		0.004	mg/L	B	0.003	0.02
09	9/8/98			mg/L	U	0.003	0.02
13	2/9/99		0.004	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
01	3/11/98			mg/L	U	0.01	0.06
02	4/2/98			mg/L	U	0.05	0.3
04	5/6/98			mg/L	U	0.01	0.06
06	6/10/98		0.02	mg/L	B	0.01	0.06
09	9/8/98		0.01	mg/L	B	0.01	0.06
13	2/9/99			mg/L	U	0.01	0.06
<b>Copper, total</b>							
01	3/11/98			mg/L	U	0.01	0.06
02	4/2/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.02	0.1
06	6/10/98			mg/L	U	0.01	0.06
09	9/8/98			mg/L	U	0.01	0.06
13	2/9/99			mg/L	U	0.01	0.06
<b>Lead, total</b>							
01	3/11/98			mg/L	U	0.005	0.03
02	4/2/98			mg/L	U	0.001	0.006
04	5/6/98			mg/L	U	0.002	0.01
06	6/10/98		0.005	mg/L	B	0.001	0.006
09	9/8/98			mg/L	U	0.002	0.01
13	2/9/99			mg/L	U	0.006	0.03
<b>Nickel, total</b>							
01	3/11/98			mg/L	U	0.01	0.06

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PQL = Practical Quantitation Limit

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
	02	4/2/98		mg/L	U	0.01	0.06
	04	5/6/98		mg/L	U	0.01	0.06
	06	6/10/98	0.01	mg/L	B	0.01	0.06
	09	9/8/98		mg/L	U	0.01	0.06
	13	2/9/99	0.01	mg/L	B	0.01	0.06
<b>Silver, total</b>							
	01	3/11/98		mg/L	U	0.006	0.03
	02	4/2/98		mg/L	U	0.006	0.03
	04	5/6/98		mg/L	U	0.01	0.06
	06	6/10/98		mg/L	U	0.006	0.03
	09	9/8/98		mg/L	U	0.006	0.03
	13	2/9/99		mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
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**PW5-14****Cadmium, total**

01	3/11/98		mg/L	U	0.02	0.08
02	4/1/98		mg/L	U	0.003	0.02
04	5/5/98		mg/L	U	0.003	0.02
06	6/9/98	0.004	mg/L	B	0.003	0.02
13	2/9/99	0.005	mg/L	B	0.003	0.02

**Chromium, total**

01	3/11/98		mg/L	U	0.06	0.3
02	4/1/98		mg/L	U	0.01	0.06
04	5/5/98		mg/L	U	0.01	0.06
06	6/9/98		mg/L	U	0.01	0.06
13	2/9/99		mg/L	U	0.01	0.06

**Copper, total**

01	3/11/98		mg/L	U	0.01	0.06
02	4/1/98		mg/L	U	0.01	0.06
04	5/5/98		mg/L	U	0.01	0.06
06	6/9/98		mg/L	U	0.01	0.06
13	2/9/99		mg/L	U	0.01	0.06

**Lead, total**

01	3/11/98		mg/L	U	0.002	0.01
02	4/1/98		mg/L	U	0.002	0.01
04	5/5/98		mg/L	U	0.005	0.03
06	6/9/98		mg/L	U	0.001	0.006
13	2/9/99	0.003	mg/L	B	0.002	0.01

**Nickel, total**

01	3/11/98		mg/L	U	0.06	0.3
02	4/1/98		mg/L	U	0.01	0.06
04	5/5/98		mg/L	U	0.05	0.3
06	6/9/98		mg/L	U	0.01	0.06
13	2/9/99		mg/L	U	0.01	0.06

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\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
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**Silver, total**

01	3/11/98		mg/L	U	0.006	0.03
02	4/1/98		mg/L	U	0.006	0.03
04	5/5/98	0.007	mg/L	B	0.006	0.03
06	6/9/98		mg/L	U	0.006	0.03
13	2/9/99		mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-15</b>							
<b>Cadmium, total</b>							
01	3/12/98		0.027	mg/L		0.003	0.02
02	4/1/98		0.049	mg/L		0.003	0.02
04	5/5/98		0.014	mg/L	B	0.003	0.02
06	6/9/98			mg/L	U	0.003	0.02
09	9/8/98			mg/L	U	0.003	0.02
13	2/9/99			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
01	3/12/98		0.20	mg/L		0.01	0.06
02	4/1/98		0.43	mg/L		0.01	0.06
04	5/5/98		0.17	mg/L		0.01	0.06
06	6/9/98		0.52	mg/L		0.01	0.06
09	9/8/98		0.65	mg/L		0.01	0.06
13	2/9/99		0.08	mg/L		0.01	0.06
<b>Copper, total</b>							
01	3/12/98		0.04	mg/L	B	0.01	0.06
02	4/1/98		0.08	mg/L		0.01	0.06
04	5/5/98			mg/L	U	0.01	0.06
06	6/9/98			mg/L	U	0.01	0.06
09	9/8/98			mg/L	U	0.01	0.06
13	2/9/99			mg/L	U	0.01	0.06
<b>Lead, total</b>							
01	3/12/98		0.002	mg/L	B	0.001	0.006
02	4/1/98		0.003	mg/L	B	0.002	0.01
04	5/5/98			mg/L	U	0.002	0.01
06	6/9/98			mg/L	U	0.001	0.006
09	9/8/98			mg/L	U	0.001	0.006
13	2/9/99			mg/L	U	0.001	0.006
<b>Nickel, total</b>							
01	3/12/98		0.03	mg/L	B	0.01	0.06

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**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
	02	4/1/98	0.07	mg/L		0.01	0.06
	04	5/5/98	0.02	mg/L	B	0.01	0.06
	06	6/9/98		mg/L	U	0.01	0.06
	09	9/8/98		mg/L	U	0.01	0.06
	13	2/9/99		mg/L	U	0.01	0.06
<b>Silver, total</b>							
	01	3/12/98	0.033	mg/L		0.006	0.03
	02	4/1/98	0.049	mg/L		0.006	0.03
	04	5/5/98	0.010	mg/L	B	0.006	0.03
	06	6/9/98		mg/L	U	0.006	0.03
	09	9/8/98		mg/L	U	0.006	0.03
	13	2/9/99		mg/L	U	0.006	0.03

**PW5-15D**

<b>Cadmium, total</b>							
	06	6/9/98	0.009	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
	06	6/9/98	0.54	mg/L		0.01	0.06
<b>Copper, total</b>							
	06	6/9/98	0.02	mg/L	B	0.01	0.06
<b>Lead, total</b>							
	06	6/9/98	0.003	mg/L	B	0.001	0.006
<b>Nickel, total</b>							
	06	6/9/98	0.01	mg/L	B	0.01	0.06
<b>Silver, total</b>							
	06	6/9/98	0.007	mg/L	B	0.006	0.03



## Well ID:

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
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## PW5-16

## Cadmium, total

01	3/12/98	0.05	mg/L	B	0.02	0.08
09	9/8/98	0.247	mg/L		0.003	0.02
13	2/10/99	0.072	mg/L		0.003	0.02

## Chromium, total

01	3/12/98	1.60	mg/L		0.06	0.3
09	9/8/98	0.14	mg/L		0.01	0.06
13	2/10/99	0.15	mg/L		0.01	0.06

## Copper, total

01	3/12/98	0.04	mg/L	B	0.01	0.06
09	9/8/98		mg/L	U	0.01	0.06
13	2/10/99		mg/L	U	0.01	0.06

## Lead, total

01	3/12/98	0.018	mg/L	B	0.005	0.03
09	9/8/98		mg/L	U	0.001	0.006
13	2/10/99	0.004	mg/L	B	0.004	0.02

## Nickel, total

01	3/12/98	0.15	mg/L		0.01	0.06
09	9/8/98	2.34	mg/L		0.01	0.06
13	2/10/99	0.03	mg/L	B	0.01	0.06

## Silver, total

01	3/12/98		mg/L	U	0.006	0.03
09	9/8/98		mg/L	U	0.006	0.03
13	2/10/99		mg/L	U	0.006	0.03

## Well ID:

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
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## PW5-17

## Cadmium, total

01	3/11/98	0.05	mg/L	B	0.02	0.08
02	4/1/98	0.011	mg/L	B	0.003	0.02
04	5/5/98	0.005	mg/L	B	0.003	0.02
06	6/9/98	0.006	mg/L	B	0.003	0.02
13	2/9/99	0.004	mg/L	B	0.003	0.02

## Chromium, total

01	3/11/98	0.12	mg/L	B	0.06	0.3
02	4/1/98	0.06	mg/L		0.01	0.06
04	5/5/98		mg/L	U	0.01	0.06
06	6/9/98		mg/L	U	0.01	0.06
13	2/9/99		mg/L	U	0.01	0.06

## Copper, total

01	3/11/98	0.06	mg/L		0.01	0.06
02	4/1/98	0.04	mg/L	B	0.01	0.06
04	5/5/98		mg/L	U	0.01	0.06
06	6/9/98		mg/L	U	0.01	0.06
13	2/9/99		mg/L	U	0.01	0.06

## Lead, total

01	3/11/98		mg/L	U	0.005	0.03
02	4/1/98	0.010	mg/L		0.002	0.01
04	5/5/98		mg/L	U	0.005	0.03
06	6/9/98		mg/L	U	0.001	0.006
13	2/9/99		mg/L	U	0.006	0.03

## Nickel, total

01	3/11/98		mg/L	U	0.01	0.06
02	4/1/98		mg/L	U	0.01	0.06
04	5/5/98		mg/L	U	0.02	0.1
06	6/9/98		mg/L	U	0.01	0.06
13	2/9/99		mg/L	U	0.01	0.06

**Inorganics** Qualifiers = (Based on EPA CLP 3/90)

U= analyte was not detected at the indicated MDL

B = analyte was detected at a value between MDL and PQL

MDL = Method Detection Limit

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
Silver, total							
	01	3/11/98		mg/L	U	0.006	0.03
	02	4/1/98		mg/L	U	0.006	0.03
	04	5/5/98		mg/L	U	0.01	0.06
	06	6/9/98		mg/L	U	0.006	0.03
	13	2/9/99		mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
PW5-18							
Cadmium, total							
	01	3/11/98	0.004	mg/L	B	0.003	0.02
	02	4/1/98		mg/L	U	0.003	0.02
	04	5/5/98		mg/L	U	0.003	0.02
	06	6/9/98		mg/L	U	0.003	0.02
	09	9/8/98		mg/L	U	0.003	0.02
	13	2/9/99	0.006	mg/L	B	0.003	0.02
Chromium, total							
	01	3/11/98		mg/L	U	0.01	0.06
	02	4/1/98		mg/L	U	0.01	0.06
	04	5/5/98		mg/L	U	0.01	0.06
	06	6/9/98		mg/L	U	0.01	0.06
	09	9/8/98		mg/L	U	0.01	0.06
	13	2/9/99		mg/L	U	0.01	0.06
Copper, total							
	01	3/11/98		mg/L	U	0.01	0.06
	02	4/1/98		mg/L	U	0.01	0.06
	04	5/5/98		mg/L	U	0.01	0.06
	06	6/9/98		mg/L	U	0.01	0.06
	09	9/8/98		mg/L	U	0.01	0.06
	13	2/9/99		mg/L	U	0.01	0.06
Lead, total							
	01	3/11/98	0.010	mg/L	B	0.006	0.03
	02	4/1/98		mg/L	U	0.002	0.01
	04	5/5/98		mg/L	U	0.002	0.01
	06	6/9/98		mg/L	U	0.001	0.006
	09	9/8/98		mg/L	U	0.002	0.01
	13	2/9/99		mg/L	U	0.006	0.03
Nickel, total							
	01	3/11/98		mg/L	U	0.01	0.06

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

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MDL = Method Detection Limit

B = analyte was detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
	02	4/1/98		mg/L	U	0.01	0.06
	04	5/5/98		mg/L	U	0.02	0.1
	06	6/9/98		mg/L	U	0.01	0.06
	09	9/8/98		mg/L	U	0.01	0.06
	13	2/9/99		mg/L	U	0.01	0.06
<b>Silver, total</b>							
	01	3/11/98		mg/L	U	0.006	0.03
	02	4/1/98		mg/L	U	0.006	0.03
	04	5/5/98		mg/L	U	0.01	0.06
	06	6/9/98		mg/L	U	0.006	0.03
	09	9/8/98		mg/L	U	0.006	0.03
	13	2/9/99		mg/L	U	0.006	0.03

**PW5-18D**

<b>Cadmium, total</b>							
	01	3/11/98		mg/L	U	0.003	0.02
<b>Chromium, total</b>							
	01	3/11/98		mg/L	U	0.01	0.06
<b>Copper, total</b>							
	01	3/11/98		mg/L	U	0.01	0.06
<b>Lead, total</b>							
	01	3/11/98		mg/L	U	0.006	0.03
<b>Nickel, total</b>							
	01	3/11/98		mg/L	U	0.01	0.06
<b>Silver, total</b>							
	01	3/11/98		mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-1D</b>							
<b>Cadmium, total</b>							
	13	2/10/99	0.004	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
	13	2/10/99	0.02	mg/L	B	0.01	0.06
<b>Copper, total</b>							
	13	2/10/99		mg/L	U	0.01	0.06
<b>Lead, total</b>							
	13	2/10/99		mg/L	U	0.001	0.006
<b>Nickel, total</b>							
	13	2/10/99		mg/L	U	0.01	0.06
<b>Silver, total</b>							
	13	2/10/99		mg/L	U	0.006	0.03

**PW5-2**

<b>Cadmium, total</b>							
	13	2/10/99		mg/L	U	0.003	0.02
<b>Chromium, total</b>							
	13	2/10/99		mg/L	U	0.01	0.06
<b>Copper, total</b>							
	13	2/10/99		mg/L	U	0.01	0.06
<b>Lead, total</b>							
	13	2/10/99	0.008	mg/L	B	0.004	0.02
<b>Nickel, total</b>							
	13	2/10/99		mg/L	U	0.01	0.06
<b>Silver, total</b>							
	13	2/10/99		mg/L	U	0.006	0.03

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PQL = Practical Quantitation Limit

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**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-3</b>							
Cadmium, total							
13	2/10/99		0.003	mg/L	B	0.003	0.02
Chromium, total							
13	2/10/99		0.01	mg/L	B	0.01	0.06
Copper, total							
13	2/10/99			mg/L	U	0.01	0.06
Lead, total							
13	2/10/99		0.016	mg/L	B	0.004	0.02
Nickel, total							
13	2/10/99			mg/L	U	0.01	0.06
Silver, total							
13	2/10/99			mg/L	U	0.006	0.03

**PW5-4**

Cadmium, total							
13	2/11/99		0.004	mg/L	B	0.003	0.02
Chromium, total							
13	2/11/99		0.14	mg/L		0.01	0.06
Copper, total							
13	2/11/99			mg/L	U	0.01	0.06
Lead, total							
13	2/11/99			mg/L	U	0.006	0.03
Nickel, total							
13	2/11/99		0.03	mg/L	B	0.01	0.06
Silver, total							
13	2/11/99			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-6</b>							
Cadmium, total							
13	2/11/99			mg/L	U	0.007	0.03
Chromium, total							
13	2/11/99		0.57	mg/L		0.01	0.06
Copper, total							
13	2/11/99		0.03	mg/L	B	0.02	0.1
Lead, total							
13	2/11/99			mg/L	U	0.006	0.03
Nickel, total							
13	2/11/99		0.11	mg/L		0.01	0.06
Silver, total							
13	2/11/99			mg/L	U	0.006	0.03

**PW5-7**

Cadmium, total							
13	2/9/99		0.007	mg/L	B	0.003	0.02
Chromium, total							
13	2/9/99		0.07	mg/L		0.01	0.06
Copper, total							
13	2/9/99			mg/L	U	0.01	0.06
Lead, total							
13	2/9/99			mg/L	U	0.002	0.01
Nickel, total							
13	2/9/99		0.02	mg/L	B	0.01	0.06
Silver, total							
13	2/9/99			mg/L	U	0.006	0.03

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PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>PW5-8</b>							
<b>Cadmium, total</b>							
13	2/9/99		0.021	mg/L		0.003	0.02
<b>Chromium, total</b>							
13	2/9/99		0.10	mg/L		0.01	0.06
<b>Copper, total</b>							
13	2/9/99		0.15	mg/L		0.01	0.06
<b>Lead, total</b>							
13	2/9/99			mg/L	U	0.004	0.02
<b>Nickel, total</b>							
13	2/9/99		0.12	mg/L		0.01	0.06
<b>Silver, total</b>							
13	2/9/99			mg/L	U	0.006	0.03

**PW5-9**

<b>Cadmium, total</b>							
13	2/9/99			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
13	2/9/99		0.01	mg/L	B	0.01	0.06
<b>Copper, total</b>							
13	2/9/99			mg/L	U	0.01	0.06
<b>Lead, total</b>							
13	2/9/99			mg/L	U	0.006	0.03
<b>Nickel, total</b>							
13	2/9/99			mg/L	U	0.01	0.06
<b>Silver, total</b>							
13	2/9/99			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>SW5-01</b>							
<b>Cadmium, total</b>							
02	4/2/98		0.013	mg/L	B	0.003	0.02
04	5/6/98		0.016	mg/L	B	0.003	0.02
06	6/10/98			mg/L	U	0.003	0.02
09	9/8/98			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
02	4/2/98		0.06	mg/L		0.01	0.06
04	5/6/98		0.10	mg/L		0.01	0.06
06	6/10/98		0.26	mg/L		0.01	0.06
09	9/8/98		0.95	mg/L		0.01	0.06
<b>Copper, total</b>							
02	4/2/98		0.05	mg/L	B	0.01	0.06
04	5/6/98		0.03	mg/L	B	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
09	9/8/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
02	4/2/98		0.002	mg/L	B	0.001	0.006
04	5/6/98		0.015	mg/L		0.002	0.01
06	6/10/98			mg/L	U	0.001	0.006
09	9/8/98			mg/L	U	0.001	0.006
<b>Nickel, total</b>							
02	4/2/98		0.06	mg/L		0.01	0.06
04	5/6/98		0.02	mg/L	B	0.01	0.06
06	6/10/98		0.01	mg/L	B	0.01	0.06
09	9/8/98		0.01	mg/L	B	0.01	0.06
<b>Silver, total</b>							
02	4/2/98			mg/L	U	0.006	0.03
04	5/6/98			mg/L	U	0.006	0.03
06	6/10/98			mg/L	U	0.006	0.03
09	9/8/98			mg/L	U	0.006	0.03

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**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>SW5-02</b>							
<b>Cadmium, total</b>							
02	4/2/98		0.005	mg/L	B	0.003	0.02
04	5/6/98		0.013	mg/L	B	0.003	0.02
06	6/10/98		0.004	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
02	4/2/98		0.05	mg/L	B	0.01	0.06
04	5/6/98		0.11	mg/L		0.01	0.06
06	6/10/98		0.13	mg/L		0.01	0.06
<b>Copper, total</b>							
02	4/2/98		0.02	mg/L	B	0.01	0.06
04	5/6/98		0.02	mg/L	B	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
02	4/2/98		0.005	mg/L	B	0.001	0.006
04	5/6/98		0.006	mg/L	B	0.002	0.01
06	6/10/98			mg/L	U	0.001	0.006
<b>Nickel, total</b>							
02	4/2/98		0.01	mg/L	B	0.01	0.06
04	5/6/98		0.03	mg/L	B	0.01	0.06
06	6/10/98		0.03	mg/L	B	0.01	0.06
<b>Silver, total</b>							
02	4/2/98			mg/L	U	0.006	0.03
04	5/6/98			mg/L	U	0.006	0.03
06	6/10/98			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>SW5-03</b>							
<b>Cadmium, total</b>							
02	4/2/98			mg/L	U	0.02	0.08
04	5/6/98			mg/L	U	0.003	0.02
06	6/10/98		0.004	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
02	4/2/98		0.02	mg/L	B	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Copper, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
02	4/2/98		0.007	mg/L		0.001	0.006
04	5/6/98			mg/L	U	0.002	0.01
06	6/10/98			mg/L	U	0.001	0.006
<b>Nickel, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Silver, total</b>							
02	4/2/98			mg/L	U	0.006	0.03
04	5/6/98			mg/L	U	0.006	0.03
06	6/10/98			mg/L	U	0.006	0.03

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

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PQL = Practical Quantitation Limit

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**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>SW5-03D</b>							
<b>Cadmium, total</b>							
02	4/2/98			mg/L	U	0.003	0.02
06	6/10/98			mg/L	U	0.003	0.02
<b>Chromium, total</b>							
02	4/2/98	0.03		mg/L	B	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Copper, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
02	4/2/98	0.006		mg/L		0.001	0.006
06	6/10/98			mg/L	U	0.001	0.006
<b>Nickel, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Silver, total</b>							
02	4/2/98			mg/L	U	0.006	0.03
06	6/10/98			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>SW5-04</b>							
<b>Cadmium, total</b>							
02	4/2/98			mg/L	U	0.02	0.08
04	5/6/98	0.004		mg/L	B	0.003	0.02
06	6/10/98	0.006		mg/L	B	0.003	0.02
<b>Chromium, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/10/98	0.03		mg/L	B	0.01	0.06
<b>Copper, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Lead, total</b>							
02	4/2/98	0.003		mg/L	B	0.001	0.006
04	5/6/98			mg/L	U	0.002	0.01
06	6/10/98	0.002		mg/L	B	0.001	0.006
<b>Nickel, total</b>							
02	4/2/98			mg/L	U	0.01	0.06
04	5/6/98			mg/L	U	0.01	0.06
06	6/10/98			mg/L	U	0.01	0.06
<b>Silver, total</b>							
02	4/2/98			mg/L	U	0.006	0.03
04	5/6/98			mg/L	U	0.006	0.03
06	6/10/98			mg/L	U	0.006	0.03

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

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B = analyte was detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

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**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>SW5-04D</b>							
Cadmium, total							
04	5/6/98			mg/L	U	0.003	0.02
Chromium, total							
04	5/6/98	0.02		mg/L	B	0.01	0.06
Copper, total							
04	5/6/98			mg/L	U	0.01	0.06
Lead, total							
04	5/6/98			mg/L	U	0.002	0.01
Nickel, total							
04	5/6/98			mg/L	U	0.01	0.06
Silver, total							
04	5/6/98			mg/L	U	0.006	0.03

**SW5-04MS**

Cadmium, total							
04	5/6/98	0.004		mg/L	B	0.003	0.02
Chromium, total							
04	5/6/98	0.01		mg/L	B	0.01	0.06
Copper, total							
04	5/6/98			mg/L	U	0.01	0.06
Lead, total							
04	5/6/98			mg/L	U	0.001	0.005
Nickel, total							
04	5/6/98			mg/L	U	0.01	0.06
Silver, total							
04	5/6/98			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>SW5-1</b>							
Cadmium, total							
01	3/12/98			mg/L	U	0.003	0.02
13	2/10/99			mg/L	U	0.003	0.02
Chromium, total							
01	3/12/98	0.05		mg/L	B	0.01	0.06
13	2/10/99	1.85		mg/L		0.01	0.06
Copper, total							
01	3/12/98	0.02		mg/L	B	0.01	0.06
13	2/10/99	0.02		mg/L	B	0.01	0.06
Lead, total							
01	3/12/98	0.007		mg/L		0.001	0.006
13	2/10/99	0.010		mg/L		0.001	0.006
Nickel, total							
01	3/12/98			mg/L	U	0.01	0.06
13	2/10/99	0.04		mg/L	B	0.01	0.06
Silver, total							
01	3/12/98			mg/L	U	0.006	0.03
13	2/10/99			mg/L	U	0.006	0.03

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

U= analyte was not detected at the indicated MDL

MDL = Method Detection Limit

B = analyte was detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL



**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
---------	-------	------	-----------	-------	------	-----	-----

**SW5-1D****Cadmium, total**

01	3/12/98		mg/L	U	0.003	0.02
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**Chromium, total**

01	3/12/98	0.05	mg/L	B	0.01	0.06
----	---------	------	------	---	------	------

**Copper, total**

01	3/12/98	0.02	mg/L	B	0.01	0.06
----	---------	------	------	---	------	------

**Lead, total**

01	3/12/98	0.005	mg/L	B	0.001	0.006
----	---------	-------	------	---	-------	-------

**Nickel, total**

01	3/12/98		mg/L	U	0.01	0.06
----	---------	--	------	---	------	------

**Silver, total**

01	3/12/98		mg/L	U	0.006	0.03
----	---------	--	------	---	-------	------

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
---------	-------	------	-----------	-------	------	-----	-----

**SW5-2****Cadmium, total**

01	3/12/98	0.015	mg/L	B	0.003	0.02
----	---------	-------	------	---	-------	------

13	2/10/99	0.033	mg/L		0.003	0.02
----	---------	-------	------	--	-------	------

**Chromium, total**

01	3/12/98	0.06	mg/L		0.01	0.06
----	---------	------	------	--	------	------

13	2/10/99	0.19	mg/L		0.01	0.06
----	---------	------	------	--	------	------

**Copper, total**

01	3/12/98	0.04	mg/L	B	0.01	0.06
----	---------	------	------	---	------	------

13	2/10/99	0.04	mg/L	B	0.01	0.06
----	---------	------	------	---	------	------

**Lead, total**

01	3/12/98	0.004	mg/L	B	0.001	0.006
----	---------	-------	------	---	-------	-------

13	2/10/99	0.011	mg/L		0.001	0.006
----	---------	-------	------	--	-------	-------

**Nickel, total**

01	3/12/98	0.07	mg/L		0.01	0.06
----	---------	------	------	--	------	------

13	2/10/99	0.05	mg/L	B	0.01	0.06
----	---------	------	------	---	------	------

**Silver, total**

01	3/12/98		mg/L	U	0.006	0.03
----	---------	--	------	---	-------	------

13	2/10/99		mg/L	U	0.006	0.03
----	---------	--	------	---	-------	------

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

U= analyte was not detected at the indicated MDL

MDL = Method Detection Limit

B = analyte was detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
---------	-------	------	-----------	-------	------	-----	-----

**SW5-3****Cadmium, total**

01	3/12/98	0.005	mg/L	B	0.003	0.02
13	2/11/99	0.006	mg/L	B	0.003	0.02

**Chromium, total**

01	3/12/98	0.02	mg/L	B	0.01	0.06
13	2/11/99	0.01	mg/L	B	0.01	0.06

**Copper, total**

01	3/12/98		mg/L	U	0.01	0.06
13	2/11/99		mg/L	U	0.01	0.06

**Lead, total**

01	3/12/98	0.004	mg/L	B	0.002	0.01
13	2/11/99		mg/L	U	0.004	0.02

**Nickel, total**

01	3/12/98		mg/L	U	0.01	0.06
13	2/11/99		mg/L	U	0.01	0.06

**Silver, total**

01	3/12/98		mg/L	U	0.006	0.03
13	2/11/99		mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
---------	-------	------	-----------	-------	------	-----	-----

**SW5-3D****Cadmium, total**

13	2/11/99	0.005	mg/L	B	0.003	0.02
----	---------	-------	------	---	-------	------

**Chromium, total**

13	2/11/99	0.02	mg/L	B	0.01	0.06
----	---------	------	------	---	------	------

**Copper, total**

13	2/11/99		mg/L	U	0.01	0.06
----	---------	--	------	---	------	------

**Lead, total**

13	2/11/99		mg/L	U	0.006	0.03
----	---------	--	------	---	-------	------

**Nickel, total**

13	2/11/99		mg/L	U	0.01	0.06
----	---------	--	------	---	------	------

**Silver, total**

13	2/11/99		mg/L	U	0.006	0.03
----	---------	--	------	---	-------	------

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

U= analyte was not detected at the indicated MDL

MDL = Method Detection Limit

B = analyte was detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
<b>SW5-4</b>							
<b>Cadmium, total</b>							
01	3/12/98		0.006	mg/L	B	0.003	0.02
13	2/11/99		0.008	mg/L	B	0.003	0.02
<b>Chromium, total</b>							
01	3/12/98		0.02	mg/L	B	0.01	0.06
13	2/11/99		0.03	mg/L	B	0.01	0.06
<b>Copper, total</b>							
01	3/12/98			mg/L	U	0.01	0.06
13	2/11/99			mg/L	U	0.01	0.06
<b>Lead, total</b>							
01	3/12/98			mg/L	U	0.002	0.01
13	2/11/99			mg/L	U	0.004	0.02
<b>Nickel, total</b>							
01	3/12/98			mg/L	U	0.01	0.06
13	2/11/99			mg/L	U	0.01	0.06
<b>Silver, total</b>							
01	3/12/98			mg/L	U	0.006	0.03
13	2/11/99			mg/L	U	0.006	0.03

**Well ID:**

Analyte	Round	Date	Results**	Units	Flag	MDL	PQL
---------	-------	------	-----------	-------	------	-----	-----

**Inorganics**      **Qualifiers = (Based on EPA CLP 3/90)**

U= analyte was not detected at the indicated MDL

MDL = Method Detection Limit

B = analyte was detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

\*\* if no value is listed, analyte was not detected at or above MDL

**APPENDIX E**

**CHROMIUM VI SAMPLING DATA RESULTS**

## Chromium VI Determinations By Well

Well/Sample ID		Description	RESULTS	UNITS	Detection Limits	Date Sampled
Round						
AW5-13						
13		Sample	0.02	mg/L	0.01	12-Feb-99
AW5-20						
13		Sample	0.07	mg/L	0.01	12-Feb-99
13		Duplicate	0.10	mg/L	0.01	12-Feb-99
AW5-23						
13		Sample	0.01	mg/L	0.01	12-Feb-99
CW5-11						
13		Sample	ND	mg/L	0.01	12-Feb-99
CW5-12						
13		Sample	0.02	mg/L	0.01	12-Feb-99
CW5-13						
13		Sample	ND	mg/L	0.01	12-Feb-99
LP07C						
10		Sample	0.71	mg/L	0.04	02-Oct-98
LP09B						
10		Sample	ND	mg/L	0.01	02-Oct-98
LP09C						
10		Sample	2.7	mg/L	0.5	02-Oct-98
MW5-01						
02		Sample	ND	mg/L	0.01	02-Apr-98
03		Sample	ND	mg/L	0.01	22-Apr-98
04		Sample	ND	mg/L	0.01	07-May-98
05		Sample	ND	mg/L	0.01	20-May-98
05		Duplicate	ND	mg/L	0.01	20-May-98
06		Sample	ND	mg/L	0.01	10-Jun-98
13		Sample	ND	mg/L	0.01	12-Feb-99
MW5-06						
02		Sample	ND	mg/L	0.01	02-Apr-98
02		Duplicate	ND	mg/L	0.01	02-Apr-98
03		Sample	ND	mg/L	0.01	22-Apr-98
04		Sample	ND	mg/L	0.01	07-May-98
05		Sample	ND	mg/L	0.01	20-May-98
06		Sample	ND	mg/L	0.01	10-Jun-98
13		Sample	ND	mg/L	0.01	12-Feb-99

Well/Sample ID		Description	RESULTS	UNITS	Detection Limits	Date Sampled
Round						
PW5-01						
01	Sample	ND	mg/L	0.01	11-Mar-98	
02	Sample	ND	mg/L	0.01	01-Apr-98	
03	Sample	ND	mg/L	0.01	22-Apr-98	
04	Sample	ND	mg/L	0.01	05-May-98	
05	Sample	ND	mg/L	0.01	19-May-98	
06	Sample	ND	mg/L	0.01	09-Jun-98	
10	Sample	ND	mg/L	0.01	07-Oct-98	
PW5-02						
01	Sample	ND	mg/L	0.01	11-Mar-98	
02	Sample	ND	mg/L	0.01	01-Apr-98	
03	Sample	ND	mg/L	0.01	22-Apr-98	
04	Sample	ND	mg/L	0.01	05-May-98	
05	Sample	ND	mg/L	0.01	19-May-98	
06	Sample	ND	mg/L	0.01	09-Jun-98	
PW5-03						
01	Sample	ND	mg/L	0.01	12-Mar-98	
PW5-04						
01	Sample	ND	mg/L	0.01	12-Mar-98	
01	Duplicate	ND	mg/L	0.01	12-Mar-98	
PW5-05						
01	Sample	ND	mg/L	0.01	12-Mar-98	
02	Sample	ND	mg/L	0.01	01-Apr-98	
03	Sample	ND	mg/L	0.01	21-Apr-98	
04	Sample	ND	mg/L	0.01	06-May-98	
05	Sample	ND	mg/L	0.01	20-May-98	
06	Sample	ND	mg/L	0.01	09-Jun-98	
07	Sample	ND	mg/L	0.01	07-Jul-98	
07	Duplicate	ND	mg/L	0.01	07-Jul-98	
08	Sample	ND	mg/L	0.01	05-Aug-98	
09	Sample	ND	mg/L	0.01	08-Sep-98	
10	Sample	ND	mg/L	0.01	07-Oct-98	

Well/Sample ID		Description	RESULTS	UNITS	Detection Limits	Date Sampled
Round						
PW5-06						
01	Sample	ND	mg/L	0.01	12-Mar-98	
02	Sample	ND	mg/L	0.01	01-Apr-98	
03	Sample	ND	mg/L	0.01	21-Apr-98	
04	Sample	ND	mg/L	0.01	06-May-98	
04	Duplicate	ND	mg/L	0.01	06-May-98	
05	Sample	ND	mg/L	0.01	20-May-98	
06	Sample	ND	mg/L	0.01	09-Jun-98	
07	Sample	ND	mg/L	0.01	07-Jul-98	
08	Sample	ND	mg/L	0.01	05-Aug-98	
09	Sample	ND	mg/L	0.01	08-Sep-98	
09	Duplicate	ND	mg/L	0.01	08-Sep-98	
10	Sample	0.02	mg/L	0.01	07-Oct-98	
PW5-07						
01	Sample	ND	mg/L	0.01	12-Mar-98	
02	Sample	ND	mg/L	0.01	02-Apr-98	
03	Sample	ND	mg/L	0.01	22-Apr-98	
04	Sample	ND	mg/L	0.01	05-May-98	
05	Sample	ND	mg/L	0.01	19-May-98	
06	Sample	ND	mg/L	0.01	09-Jun-98	
PW508						
02	Sample	ND	mg/L	0.01	02-Apr-98	
PW5-08						
01	Sample	ND	mg/L	0.01	12-Mar-98	
03	Sample	ND	mg/L	0.01	21-Apr-98	
03	Duplicate	ND	mg/L	0.01	21-Apr-98	
04	Sample	ND	mg/L	0.01	06-May-98	
05	Sample	ND	mg/L	0.01	19-May-98	
06	Sample	ND	mg/L	0.01	09-Jun-98	
07	Sample	ND	mg/L	0.01	07-Jul-98	
08	Sample	ND	mg/L	0.01	05-Aug-98	
09	Sample	ND	mg/L	0.01	08-Sep-98	
10	Sample	ND	mg/L	0.01	07-Oct-98	
10	Duplicate	ND	mg/L	0.01	07-Oct-98	

Well/Sample ID		RESULTS	UNITS	Detection Limits	Date Sampled
Round	Description				
PW5-09					
01	Sample	ND	mg/L	0.01	12-Mar-98
02	Sample	ND	mg/L	0.01	01-Apr-98
03	Sample	ND	mg/L	0.01	21-Apr-98
04	Sample	ND	mg/L	0.01	06-May-98
05	Sample	ND	mg/L	0.01	19-May-98
06	Sample	ND	mg/L	0.01	09-Jun-98
07	Sample	ND	mg/L	0.01	07-Jul-98
08	Sample	ND	mg/L	0.01	05-Aug-98
09	Sample	ND	mg/L	0.01	08-Sep-98
10	Sample	ND	mg/L	0.01	07-Oct-98
PW5-10					
01	Sample	ND	mg/L	0.01	12-Mar-98
02	Sample	ND	mg/L	0.01	01-Apr-98
03	Sample	ND	mg/L	0.01	21-Apr-98
04	Sample	ND	mg/L	0.01	06-May-98
05	Sample	ND	mg/L	0.01	19-May-98
06	Sample	ND	mg/L	0.01	09-Jun-98
07	Sample	ND	mg/L	0.01	07-Jul-98
08	Sample	ND	mg/L	0.01	05-Aug-98
09	Sample	ND	mg/L	0.01	08-Sep-98
10	Sample	ND	mg/L	0.01	07-Oct-98
PW5-11					
01	Sample	ND	mg/L	0.01	12-Mar-98
PW5-12					
01	Sample	ND	mg/L	0.01	11-Mar-98
01	Duplicate	ND	mg/L	0.01	11-Mar-98
PW5-13					
01	Sample	ND	mg/L	0.01	11-Mar-98
02	Sample	ND	mg/L	0.01	02-Apr-98
03	Sample	ND	mg/L	0.01	21-Apr-98
04	Sample	ND	mg/L	0.01	06-May-98
05	Sample	ND	mg/L	0.01	20-May-98
06	Sample	ND	mg/L	0.01	10-Jun-98
07	Sample	ND	mg/L	0.01	07-Jul-98
08	Sample	ND	mg/L	0.01	05-Aug-98
09	Sample	ND	mg/L	0.01	08-Sep-98
10	Sample	ND	mg/L	0.01	07-Oct-98



Well/Sample ID		RESULTS	UNITS	Detection Limits	Date Sampled
Round	Description				
PW5-14					
01	Sample	ND	mg/L	0.01	11-Mar-98
02	Sample	ND	mg/L	0.01	01-Apr-98
03	Sample	ND	mg/L	0.01	22-Apr-98
04	Sample	ND	mg/L	0.01	05-May-98
05	Sample	ND	mg/L	0.01	19-May-98
06	Sample	ND	mg/L	0.01	09-Jun-98
PW5-15					
01	Sample	ND	mg/L	0.01	12-Mar-98
02	Sample	ND	mg/L	0.01	01-Apr-98
03	Sample	ND	mg/L	0.01	21-Apr-98
04	Sample	ND	mg/L	0.01	05-May-98
05	Sample	ND	mg/L	0.01	19-May-98
06	Duplicate	ND	mg/L	0.01	09-Jun-98
07	Sample	ND	mg/L	0.01	07-Jul-98
08	Sample	ND	mg/L	0.01	05-Aug-98
08	Duplicate	ND	mg/L	0.01	05-Aug-98
09	Sample	ND	mg/L	0.01	08-Sep-98
10	Sample	ND	mg/L	0.01	07-Oct-98
PW5-16					
01	Sample	ND	mg/L	0.01	12-Mar-98
09	Sample	ND	mg/L	0.01	08-Sep-98
10	Sample	ND	mg/L	0.01	07-Oct-98
PW5-17					
01	Sample	ND	mg/L	0.01	11-Mar-98
02	Sample	ND	mg/L	0.01	01-Apr-98
03	Sample	ND	mg/L	0.01	21-Apr-98
04	Sample	ND	mg/L	0.01	05-May-98
05	Sample	ND	mg/L	0.01	19-May-98
06	Sample	ND	mg/L	0.01	09-Jun-98
PW5-18					
01	Sample	ND	mg/L	0.01	11-Mar-98
01	Duplicate	ND	mg/L	0.01	11-Mar-98
02	Sample	ND	mg/L	0.01	01-Apr-98
03	Sample	ND	mg/L	0.01	22-Apr-98
04	Sample	ND	mg/L	0.01	05-May-98
05	Sample	ND	mg/L	0.01	20-May-98
06	Sample	ND	mg/L	0.01	09-Jun-98
07	Sample	ND	mg/L	0.01	07-Jul-98
08	Sample	ND	mg/L	0.01	05-Aug-98
09	Sample	ND	mg/L	0.01	08-Sep-98
10	Sample	ND	mg/L	0.01	07-Oct-98

Well/Sample ID		RESULTS	UNITS	Detection Limits	Date Sampled
Round	Description				
SW5-01					
01	Sample	ND	mg/L	0.01	12-Mar-98
01	Duplicate	ND	mg/L	0.01	12-Mar-98
02	Sample	ND	mg/L	0.01	02-Apr-98
03	Sample	ND	mg/L	0.01	22-Apr-98
03	Duplicate	ND	mg/L	0.01	22-Apr-98
04	Sample	ND	mg/L	0.01	06-May-98
05	Sample	ND	mg/L	0.01	20-May-98
06	Sample	ND	mg/L	0.01	10-Jun-98
07	Sample	ND	mg/L	0.01	07-Jul-98
08	Sample	ND	mg/L	0.01	05-Aug-98
09	Sample	ND	mg/L	0.01	08-Sep-98
SW5-02					
01	Sample	ND	mg/L	0.01	12-Mar-98
02	Sample	ND	mg/L	0.01	02-Apr-98
03	Sample	ND	mg/L	0.01	22-Apr-98
04	Sample	ND	mg/L	0.01	06-May-98
05	Sample	ND	mg/L	0.01	20-May-98
05	Duplicate	ND	mg/L	0.01	20-May-98
06	Sample	ND	mg/L	0.01	10-Jun-98
SW5-03					
01	Sample	ND	mg/L	0.01	12-Mar-98
02	Sample	ND	mg/L	0.01	02-Apr-98
02	Duplicate	ND	mg/L	0.01	02-Apr-98
03	Sample	ND	mg/L	0.01	22-Apr-98
04	Sample	ND	mg/L	0.01	06-May-98
05	Sample	ND	mg/L	0.01	20-May-98
06	Duplicate	ND	mg/L	0.01	10-Jun-98
SW5-04					
01	Sample	ND	mg/L	0.01	12-Mar-98
02	Sample	ND	mg/L	0.01	02-Apr-98
03	Sample	ND	mg/L	0.01	22-Apr-98
04	Sample	ND	mg/L	0.01	06-May-98
04	Duplicate	ND	mg/L	0.01	06-May-98
05	Sample	ND	mg/L	0.01	20-May-98
06	Sample	ND	mg/L	0.01	10-Jun-98

# **APPENDIX F**

## **BIOTA STUDY REPORT**

**ASSESSMENT OF THE BIOLOGICAL IMPACTS  
OF THE  
ELECTROKINETICS DEMONSTRATION  
PROJECT  
AT THE NAVAL AIR STATION PT. MUGU**

**FINAL REPORT**

**RICHARD F. AMBROSE, PH.D.  
MICHELLE ADAMS ANGHERA**

Report to Advancia Corporation

**APRIL 9, 1999**

## EXECUTIVE SUMMARY

A new *in situ* remediation method to remove metal contaminants from soil was tested at the Naval Air Station Point Mugu. This method involves the application of electrical currents to sediments in order to concentrate the metals for subsequent removal. Although the electrokinetic process avoids the disruption caused by sediment removal, there is a potential that it will negatively affect organisms in the treatment area. To evaluate this possibility, we monitored biota most likely to be affected (benthic invertebrate and plant populations) by the demonstration. A simplified BACI (Before-After-Control-Impact) study design was used with one set of samples collected Before the demonstration and one set of samples collected After the demonstration. Effects of the treatment were assessed by examining the changes in the biota before and after the electrokinetic process, both at the impact site and a nearby control site. The Before samples were collected in February/March 1998 and the After samples were collected in November 1998.

The construction to install the demonstration equipment affected the Impact site by altering the sediment characteristics and trampling (killing) the vegetation in the treatment area. These effects were noticed during the Before sampling. The invertebrates living in the salt marsh sediments were consistently less abundant than those in the nearby Control site, suggesting an impact of construction on the salt marsh infauna. In the demonstration project, there was little disturbance of the tidal creek substrate where our infauna samples were taken, and no effects on the infauna there were observed.

After the demonstration, two changes apparently caused by the demonstration were observed. There was a 98% decrease in benthic invertebrates in the unvegetated edge of the creek; in contrast, infauna at the Control site increased during the study period. The Impact site also had decreased fish and crab catches, whereas the nearby Control site did not. In spite of the impacts to the vegetation caused by the installation of the demonstration equipment, no impacts to the salt marsh infauna were observed. Frogs around the waste pits at the Impact site also did not appear to be affected by the demonstration.

## INTRODUCTION

A six-month demonstration project began in March 1998 to test the feasibility of an electrokinetics technology for the remediation of metals contamination in an area of Mugu Lagoon. The project involved the application of electrical currents to sediments in order to effect the movement and concentration of metals for subsequent removal. The demonstration was conducted at Site 5 Old Area 6 Shops at the Naval Air Station Pt. Mugu. Although the electrokinetics process avoids removal of wetland sediments, there is a potential that the process will negatively affect the resident organisms in the treatment area.

The work reported here assesses possible impacts on resident organisms by sampling plants and invertebrates before and after the electrokinetics process was applied to the site. This study is not meant to be comprehensive. We targeted the species most likely to have been affected by the electrokinetic process. In the interest of cost-effectiveness, we explicitly excluded a number of taxa, including birds and fish, which are either unlikely to be affected by the process because they are transients in the area or are difficult and time-consuming to study.

We conducted this biological study under contract to Advancia Corporation (formerly LB&M Associates, Inc.; 211 S.W. "A" Avenue, Lawton OK 73501-4051), which was carrying out the demonstration project. Our principal contact at Advancia was Martin Wills. We also coordinated our efforts with the Naval Air Station Pt. Mugu, particularly Steve Granade. We thank these organizations and individuals for their cooperation and assistance.

## METHODS

### Sampling Design

The choice of time and place of sampling is critical for the success of a biological assessment project. Two common sampling designs involve sampling before and after an event at the impact site ("Before-After"), and sampling after an event at the impact and control site ("Control-Impact"). Unfortunately, the inferences that can be made using these two common designs are limited because they can easily confound the impact caused by the event with natural spatial and temporal variability (see (Green, 1979) for discussion). A much more powerful design can be devised by combining these two approaches into the Before-After-Control-Impact, or BACI, design (Stewart-Oaten, Murdoch and Parker, 1986). A BACI design involves sampling a number of times at the control and impact sites **before** the action that might cause an impact begins, and then sampling a number of times at the control and impacts sites **after** the action has commenced. If there is a change in the difference between the control and impact sites after the action begins, it is evidence of an effect (see (Osenberg and Schmitt, 1996) for more detail). In statistical terms, an impact would be manifested as a time by location interaction.

The BACI design requires a number of samples before the action begins in order to estimate the average measured values at the site in the Before period. Unfortunately, for this project there was not enough time in the Before period to take sufficient samples. For this reason, we used a simplified version of BACI (also called an “optimal impact study design” by (Green, 1979)) with only one set of samples in the Before period and one set in the After period. This sampling design is the most powerful option possible given the time constraints of the demonstration project.

### **Sampling sites**

The basic study design is to use paired samples at the impact site and a nearby control site. Test Cell 2 (in the treatment area) was designated as the Impact site with the nearby Control 1 site located 5 m from its western edge (Figure 1 and 2). In case the effects of the electrokinetics altered Control 1 enough to prevent it from detecting changes in the Impact site, two more control sites (Control 2 and 3) were located approximately 100 m from the demonstration area. These reference sites were selected based on similar hydrology, landscape, and proximity to the impact site. As described below, Test Cell 2 was never activated, and it seems probable that there was little effect of the demonstration project on Control 1, so Control 1 provides the best reference site, we have focused on the comparison of the Impact site to it.

The simplified BACI design is used for salt marsh vegetation and invertebrates. Because there is no nearby natural habitat to use as a control for the pits themselves, the organisms in the pits (aquatic insects and frogs) were assessed using a simple Before-After design.

### **Sampling schedule**

The Before samples were collected between 19 February and 2 March 1998, right before the demonstration began. The After samples were collected on 9 November 1998. At each site, salt marsh samples were randomly collected along a ten meter transect running parallel to the tidal creek. The salt marsh transect was placed within two meters of the creek in the vegetated area, and the mudflat transect was placed below vegetation near the base of the tidal creek. This study design sampled salt marsh vegetation and invertebrates and mudflat invertebrates.

We originally planned on taking a second impact sample six to twelve months after the end of the demonstration project in order to provide evidence for the rate of recovery after the electrokinetics process. However, because of the truncated period of the demonstration, Advancia asked us to terminate our sampling in November 1998.

### **Sampling methods**

#### **Vegetation.**

Measurements of vegetation cover were used to determine the type of vegetation and its relative abundance in salt marsh sites. These measurements were determined by visual estimates of percent cover of each plant species in 1 m<sup>2</sup> quadrats. Three quadrats were

placed at random along a 10 m transect line. At the control sites, transects were located parallel to the tidal creek and 1-2 m from the vegetated edge of the tidal creek. There was insufficient vegetated area within the test cell of the Impact site to locate the transect parallel to the tidal creek, so at that site the transect was located perpendicular to the tidal creek in the western area of the site.

#### **Benthic invertebrates.**

Small invertebrate infauna (organisms <5 mm long living in the sediment) were collected at three random locations within the unvegetated edge of tidal creeks (called mudflat) and salt marsh transects. Samples were collected with a core (22 cm<sup>2</sup> diameter) to a depth of 4 cm, for a volume of 88 cm<sup>3</sup> each, and preserved in 40% buffered formaldehyde. The samples were later washed through a 0.3 mm sieve and stored in 70% isopropyl alcohol and Rose Bengal stain to aid in sorting. The samples were sorted and identified under a dissecting scope.

Large invertebrate infauna (>5 mm long) were sampled with a clam gun (86.5 cm<sup>2</sup> diameter) to a depth of 30 cm in the mud flat and adjacent tidal creek in all the control sites and the impact site. The samples were washed through a 5 mm sieve in the field. No living organisms were found at any site in the Before period, so no additional samples were taken in the After period.

#### **Epifauna.**

The common epifauna (organisms living on the surface of the mud) found in the area are the green shore crab (*Pachygrapsus oregonensis*) and the horn snail (*Cerithidea californica*). Horn snails were sampled by randomly placed 0.5 m<sup>2</sup> quadrants along the mudflat transects. The crabs were collected by hand in baited minnow traps and the width of their carapace and sex were recorded. Fish were sampled using minnow traps, galvanized wire cylinders 22.9-cm diameter by 44.5-cm long (6.35-mm mesh), with entry points on both ends. One trap was deployed at each site in the Before sampling period and two traps were deployed in the After sampling period to try to increase the catch. Traps were deployed for 24 hours during a high tide. Because of the high degree of variability usually associated with crab catches, this technique cannot provide an estimate of density, but rather a catch per unit effort.

#### **Sediment.**

Sediment size, sediment organic content, and salinity affect infauna (Young and Rhoads, 1971; Myers, 1972; Riddle 1988; Watling, 1988); therefore, sediment and water samples were collected at all the sample locations. Water collected in the remaining core was measured for salinity with a refractometer. Sediment samples were collected adjacent to the infauna core. Sediment grain size fractions of percent sand, silt, and clay were determined by the Bouyoucos method (Bouyoucos, 1962). Percent organic material in the soil was determined by weighing the fraction burned off in a kiln at temperatures greater than 600°C. The sediment samples were only collected in the Before period; the sediment is not expected to change within the time of this investigation.



### **Biota in the pits.**

Given the hazardous nature of the water in the pits and the logistical issues associated with sampling in them, we focused on only two taxa, aquatic insects and frogs. Moreover, we used semi-quantitative rather than quantitative sampling. Semi-quantitative sampling is cost-effective for this project and sufficient to demonstrate substantial (but not subtle) changes in the biota. Note that the absence of a control site is likely to make interpretation of these results difficult because any changes could be due either to the electrokinetic process or natural seasonal changes. Aquatic insects were to be sampled by dip nets. Observations of the location and occurrence of frogs were made.

## **RESULTS AND DISCUSSION**

### **Comparison of Control Sites**

To evaluate how similar the control sites were to the impact site, we compared the abundances of macroinvertebrates (>1 mm) in the mudflats at the four sites (Figure 3). We looked only at Before data in order to assess initial similarity. Although there were differences in total abundance, in terms of relative abundances of the common taxa, the near control (Control 1) was most similar to the impact site. The proportional abundance of the major mudflat taxa was similar at Control 1 and Impact site, and both of these sites differed from Control 2 and 3 (Figure 3).

We also examined horn snail (*Cerithidea californica*) size frequency distributions. Size frequencies can indicate important population processes such as recruitment, growth, and mortality rates (Ebert, 1973; Ebert and Russell, 1993), and so are particularly useful for looking at similarities among sites. *Cerithidea* size frequency distributions appeared most similar at Control 1 and Impact (Figure 4). The size frequency distribution at Control 3 was very different, with a bimodal distribution of small (15 mm) and large (30 mm) snails. Control 2 also had more small snails, though it was not so obviously different from Control 1 and the Impact site as was Control 3.

Because it is close to and shares the same tidal creek (and, hence, geomorphology and hydrology) as the Impact site, Control 1 was the most obvious control site. We were originally concerned that the electrokinetic process might affect the biota beyond the limits of Test Cell 2. However, Test Cell 2 was never activated during this study. Because it was closest and contained biota that were more similar to the Impact site than the other two control sites, our analysis of impacts uses only Control 1 as a control site.

### **Construction Impacts.**

Our Before samples were collected before the electrokinetic demonstration was activated. However, they were collected *after* the construction of the demonstration facility. The construction resulted in substantial physical impacts to the site. Effects on the vegetation were obvious: trampling of the salt marsh eliminated nearly all of the salt marsh plants. Only bare stems and roots were left on the site when we first visited it after construction (Table 1). Sand was added to the substrate, altering substrate composition (an important

factor controlling infauna composition and abundance; (Young and Rhoads, 1971)). The impact salt marsh had twice as much sand as Control 1 (27% to 14%) and the percent organic material was more variable (see Figure 5). It seems likely that the physical disturbance to the site affected the biota.

One way to assess the construction impact on the infauna is to compare samples taken at Control 1 and the Impact site in the Before period. This "Control-Impact" design assumes that abundances would be the same in the absence of a construction impact. Our qualitative observations suggest that the initial, pre-construction vegetation was, in fact, similar at Control 1 and the Impact site. We did not examine infauna, but it seems reasonable to expect the sites to be similar since they are only a few meters apart along the same tidal creek. However, we have no pre-construction quantitative data for comparison, so interpretation of this comparison must be done cautiously.

There was little difference in the mudflat infauna (see Before data from Figure 4 and Table 6) and no evidence of a construction impact. Most taxa were remarkably similar. The largest difference between sites, in terms of numbers, was for polychaetes, with a difference of 25 individuals; in terms of proportions, the largest difference was for oligochaetes, with a difference of 53%. In both cases, there were *more* individuals in the Impact site. The mudflat infauna were sampled at the downstream end of the demonstration area where there was little sign of disturbance from construction activities.

In contrast, there were notable differences in the salt marsh infauna (see Before data from Figure 4 and Table 5). Four of the six major taxa showed lower abundances at the Impact site. Oligochaetes, the most abundant taxon, had 23 (40%) fewer individuals, insects had 23 (79%) fewer individuals; amphipods had 6 (55%) fewer individuals, and nemerteans had 5 (100%) fewer individuals. The construction appeared to have a widespread impact on the salt marsh infauna.

### **Before-After-Control-Impact Results.**

#### **Vegetation**

*Salicornia virginica* (pickleweed) was the most common plant species at all sites. Freshly trampled *Salicornia* that was still living made up the 20% *Salicornia* present at the impact site in the Before period (Table 1). In contrast, *Salicornia* cover at the control sites was >90%, illustrating the construction effects at the Impact site. There was a slight reduction in cover at Control 2 in the After period, but otherwise little change (Table 2). However, plant cover at the Impact site declined to only 2%. Ten months after the construction the vegetation in the impact site showed no recovery from the construction impacts. It is possible that the continued decline in plant cover at the Impact site was due to the electrokinetics process (and this was what the sampling was originally designed to detect). However, given the substantial initial impacts due to construction, it is not possible to separate new electrokinetics impacts from persistent construction impacts.

### **Benthic Invertebrates**

Results of the infauna sampling for the Before period are shown in Table 3; results for the After period are shown in Table 4. Because the two sampling periods occurred in different seasons, there were some taxa (notably insects) that were present only in one set of samples. Because these natural seasonal differences are not related to the impacts of the electrokinetics demonstration, we excluded these taxa from further analyses.

In the salt marsh, oligochaetes were the most abundant taxon at both Impact and Control 1 sites (Figure 6). It is common to have high proportions (20-60% of total organisms) of oligochaetes in natural salt marshes (Minello and Webb, 1997; Moy and Levin, 1991), which is consistent with these findings. As noted above, the salt marsh infauna at the Impact was lower than Control 1 in the Before period, presumably because the salt marsh habitat at the impact site was completely trampled. However, changes in abundance from Before to After were similar at the Impact and Control sites. This can be seen in a general way from Figure 6, where both sites show a general increase from Before to After. The changes are quantified in more detail in Table 5.

A brief discussion of the general BACI approach is warranted here. Evidence for an effect would be seen as a *change* in the relationship between sites in the After period compared to the Before period. To look for this change, we calculate  $\Delta$ s, the difference between Impact and Control (see Table 5). For example, the  $\Delta$  for oligochaetes in the salt marsh is -23 in the Before period. In the absence of an impact, we would expect a similar  $\Delta$  in the After period. In fact, the  $\Delta$  in the After period is exactly the same, -23, and so there is no evidence for an effect on oligochaetes.

To summarize the comparison of  $\Delta$ s from Before to After, we calculate  $\Delta\Delta$  (After  $\Delta$  minus Before  $\Delta$ ), which in the case of oligochaetes is 0. If  $\Delta\Delta$  is less than zero, there is an indication of a negative impact. Note that our presentation here has been simplified from the normal presentation. For a variety of reasons, abundances are typically log-transformed (Schroeter, et al., 1993); here, for simplicity, we have not transformed abundances. We have not performed statistical tests because we have only one Before and one After sample. For this reason, we do not focus on small or isolated differences in  $\Delta$ s; rather, we are interested in large, consistent differences that indicate an ecologically meaningful change.

As noted above, there was no difference in the  $\Delta$  for oligochaetes from Before to After in the salt marsh (Table 5). Only one taxon, gastropods, had a negative  $\Delta\Delta$ ; gastropods increased substantially in Control, but actually declined in the impact, a change that is consistent with a negative impact. However, this change was not consistent, and in fact nemerteans and amphipods exhibited a relative increase in the After period. We present the amphipod data with some reservations, because amphipods occur largely on the surface and could easily move from area to area. Nonetheless, there is no consistent

pattern of negative impact, so we find little evidence of an impact of the electrokinetics demonstration project in the salt marsh infauna.

Polychaetes and oligochaetes were the most abundant taxa in the mudflats in the tidal creek (Figure 6). In contrast to the salt marsh infauna, the mudflat infauna changed dramatically at the Impact site. All of the infauna taxa showed relative decreases in the After period (Table 6). Oligochaetes increased from 13 to 114 in the Control site, but completely disappeared at the Impact site. Polychaetes declined at both sites, but the decline was larger at the Impact site. Gastropods and amphipods increased at the Control site but declined at the Impact site. In the mudflat, there was a consistent and large pattern of negative impact. Overall abundance at the Control site increased from the Before to After period, and declines in some species (e.g., polychaetes) were balanced by increases in others (e.g., oligochaetes). In contrast, infauna virtually disappeared from the mudflat at the Impact site. Thus, there is evidence of an impact of the electrokinetics demonstration project in the mudflat infauna

### **Epifauna**

At all sites, the *Cerithidea* densities decreased in the After period (Figure 7). This is most likely a seasonal change. Although the decline might have been slightly greater at the Impact site than Control 1, there is little evidence of a differential impact on *Cerithidea* at the Impact site.

Fish and crab counts per trap and length of organism for the Before and After sampling are listed in Table 7. *Fundulus parvipinnis* (California killifish), *Gillichthys mirabilis* (mudsucker), and *Pachygrapsus grassipes* (lined shore crab) were found at Control 1 in the Before and After periods. *Fundulus* and *Gillichthys* were also found at the Impact site in the Before period, but no epifauna were found there in the After period, in spite of the fact that we sampled for four trap-nights in the After period compared to only one trap-night in the Before. This change is consistent with an effect at the Impact site. Because the epifauna are so mobile and our sampling effort was small, it is hard to make definitive conclusions. However, the catches at the other control sites were fairly consistent. At Control 2, no fish were caught in either the Before or After. At Control 3, *Fundulus* and *Gillichthys* were caught in both the Before and After periods; in addition, two crabs were caught in the After period but no crabs were caught in the Before period.

Although the numbers are small, these data suggest an impact on fish and crabs in the Impact site. It seems unlikely that this impact was directly due to the electrokinetics process. Instead, it seems likely that these motile species were responding to prey abundances. Since mudflat infauna abundances were virtually zero in the After period at the Impact site, fish and crabs were likely avoiding this site in favor of sites with higher prey abundances.

### **Sediment Analysis**

Sediments for two mud flat sites and all four salt marsh sites have been analyzed for grain size and percent organic matter (Figure 5). There was twice as much sand in the Impact site as Control 1 (27% vs. 14%). Preliminary results show the Impact site is more variable in percent organic matter than any other site (Mean $\pm$ SD = 19.4  $\pm$  18.0, N = 5), nearly three times more variable than Control 1 (coefficient of variation = 92 vs. 33). Salinity ranged from 18 to 34 ppt at all sites.

### **Biota in the pits**

At the start of this study in February 1998, frogs were common in and around the pits and many frogs occurred on a small bush next to the cadmium pit and on the ground between the bush and the pit. Frogs were present in and around the pits during the demonstration. However, since October 1998 the sightings have declined. This decline could be due to seasonal effects, or it could be related to the fact that rainfall in 1998-99 was later and much less than rainfall the previous year. In the absence of an appropriate control, it is impossible to separate natural fluctuations from changes due to the demonstration, but the fact that the frogs were present throughout the demonstration period suggests that the demonstration had little if any effect on them.

There have been no frog sightings in the chromium pit since January 1999, most likely due to current activities that have acidified the pit occasionally. They are still seen and heard in and around the cadmium pit and the bush.

Dip net sampling for insects was attempted but no insects were or have ever been seen in the pits.

## **CONCLUSIONS**

### **Construction activities**

Installing the equipment for the demonstration project caused significant disturbance of the marsh surface. One of the potential benefits of the electrokinetic process is that it would not require removal of sediment for disposal or remediation. However, the level of activity associated with the demonstration project nonetheless disturbed the marsh. However, this disturbance was much less than what would have occurred had sediment been removed. As one indication of this, the salt marsh infauna apparently recovered during the demonstration project, since no difference between the Impact and Control sites were observed in the After period.

Any efforts to reduce the level of disturbance during installation of the equipment would obviously minimize construction impacts on the salt marsh ecosystem. In addition to the obvious trampling, one other activity whose impact might not be as obvious was the addition of sand to the substrate. The sand altered the sediment composition, which could have affected the infauna.

The salt marsh vegetation did not recover from the construction impacts during the demonstration project. Recovery may have been inhibited by the fact that the entire demonstration project was tented, thereby reducing the light received by the salt marsh plants. Although we can not predict how fast recovery would have been in full sunlight, it is possible that it would have been more rapid.

### **Electrokinetics impacts**

The main effect of the demonstration project appears to be the near-elimination of infauna in the tidal creek. The reduction in fish and crab use of the Impact site most likely is a consequence of the lack of food in the tidal creek. Because we do not have sediment chemistry data to compare to the biological data, we cannot assess the mechanism behind the reduction in creek infauna. Similarly, we cannot assess why the salt marsh infauna appeared not to be affected while the tidal creek infauna were. Because there is some tidal connection with Test Cell 1 (Anghera, personal observation), transport of materials or conditions (e.g., low pH) with the tides could be causing the impacts.

Although this study was able to detect some effects of the demonstration project, two changes in study design would improve the power of future studies. First, a true BACI design, with repeated sampling in the Before and After periods, would strengthen the conclusions and allow statistical tests for an effect. Because the samples need to be independent replicates, sampling cannot be compressed into a short period of time. Therefore, a longer lead time for the study would be required. Second, detailed information on the changes to the physical environment would be useful. These observations would provide useful information about possible mechanisms of impact and to evaluate alternative hypotheses about the impacts (Schroeter, et al., 1993). Besides the obvious physical and chemical measurements, it could be useful to look at  $\text{Cr}^{6+}$  concentrations, since this is the form most likely to affect the organisms.

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Table 1. Vegetation cover in salt marsh transects in Before period (February 1998).

Site	Collection Date	% <i>Salicornia</i>	% <i>Frankenia</i>	% <i>Spartina</i>	% Bare mud
Impact site	24-Feb-98	20	0	0	80
Near control 1	24-Feb-98	94	0	0	7
Control 2	24-Feb-98	96	0	0	3
Control 3	24-Feb-98	96	4	0	0

Table 2. Vegetation cover in salt marsh transects in After period (November 1998).

Site	Collection Date	% <i>Salicornia</i>	% <i>Frankenia</i>	% <i>Spartina</i>	% Bare mud
Impact site	11-Nov-98	2	0	0	98
Near control 1	11-Nov-98	92	0	0	8
Control 2	11-Nov-98	87	0	0	13
Control 3	11-Nov-98	97	0	0	3



Table 3. Infauna collected at the Impact and Control 1 sites in the Before period (February 1998). Site location refers to the location of each of the three randomly selected cores.

	<i>Site location</i>	<i>Tubificidae</i>	<i>Naididae</i>	<i>Enchytraeidae</i>	<i>Total Oligochaeta</i>	<i>Capitellidae</i>	<i>Spionidae-Polydora</i>	<i>Spionidae-Streblospio</i>	<i>Total Polychaeta</i>	<i>Holothuroidea</i>	<i>Nemertea</i>	<i>Platyhelminthes</i>	<i>Gastropoda</i>	<i>Amphipoda</i>	<i>Isopoda</i>	<i>Insecta</i>	<i>Total Arthropoda</i>
<i>Salt marsh</i>	2.10	3	13	0	16	5	0	0	5	0	0	0	2	1	0	2	3
<b>Impact</b>	2.1	0	0	0	7	0	0	0	0	0	0	0	0	0	0	3	3
<b>Feb-98</b>	2.7	7	4	0	11	3	1	0	4	0	0	0	0	4	0	1	5
<i>Salt marsh</i>	1.7	5	17	0	25	3	0	0	3	0	5	0	0	10	0	20	30
<b>Control 1</b>	1.1	22	5	0	27	0	0	0	0	0	0	0	1	0	0	1	1
<b>Feb-98</b>	1.10	1	4	0	5	0	0	0	0	0	0	0	0	1	0	8	9
<i>Mudflat</i>	1.11	3	0	0	3	27	0	9	36	0	0	0	0	3	0	0	3
<b>Impact</b>	1.13	0	1	0	4	8	1	8	17	0	0	0	0	0	0	0	0
<b>Feb-98</b>	1.15	7	5	1	13	60	0	12	72	0	0	1	1	10	1	0	12
<i>Mudflat</i>	2.11	3	1	2	6	47	5	10	62	1	0	1	0	1	0	0	1
<b>Control 1</b>	2.13	2	5	0	7	9	2	1	12	0	0	0	1	2	0	0	2
<b>Feb-98</b>	2.15	6	0	0	0	21	1	4	26	0	1	0	6	11	0	0	11

Table 4. Infauna collected at the Impact and Control 1 sites in the After period (November 1998). Site location refers to the location of each of the three randomly selected cores.

	<i>Site location</i>	<i>Tubificidae</i>	<i>Naididae</i>	<i>Enchytraeidae</i>	<i>Total Oligochaeta</i>	<i>Capitellidae</i>	<i>Spionidae-Polydora</i>	<i>Spionidae-Streblospio</i>	<i>Total Polychaeta</i>	<i>Holothuroidea</i>	<i>Nemertea</i>	<i>Platyhelminthes</i>	<i>Gastropoda</i>	<i>Amphipoda</i>	<i>Isopoda</i>	<i>Insecta</i>	<i>Total Arthropoda</i>
<i>Salt marsh</i> <b>Impact</b> <b>Nov-98</b>	2.1	0	0	0	39	3	0	2	5	0	1	0	0	10	0	0	10
	2.2	2	0	0	2	8	0	2	10	0	12	0	0	2	0	0	2
	2.3	1	0	0	30	0	0	0	0	0	1	0	0	5	0	0	5
<i>Salt marsh</i> <b>Control 1</b> <b>Nov-98</b>	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.2	0	0	0	90	0	0	0	0	0	2	0	14	0	0	0	0
	1.3	2	2	0	4	0	0	5	5	0	0	0	0	1	0	1	2
<i>Mudflat</i> <b>Impact</b> <b>Nov-98</b>	2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
	2.6	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1
<i>Mudflat</i> <b>Control 1</b> <b>Nov-98</b>	1.4	0	1	0	32	7	0	2	9	0	0	3	0	11	0	0	11
	1.5	0	0	0	44	0	0	0	0	0	4	0	16	0	0	0	0
	sample did not preserve correctly																

Table 5. Salt marsh spatial differences ( $\Delta$ ) in Impact minus Control in the Before and After periods; and difference of the differences ( $\Delta\Delta$ ) in After difference minus the Before difference.

Salt marsh	Organism		Before	After	$\Delta\Delta$
	Oligochaeta	Control	57	94	
		Impact	34	71	
		$\Delta$	-23	-23	0
	Polychaeta	Control	3	5	
		Impact	9	15	
		$\Delta$	6	10	4
	Nemertea	Control	5	2	
		Impact	0	14	
		$\Delta$	-5	12	17
	Gastropoda	Control	1	14	
		Impact	2	0	
		$\Delta$	1	-14	-15
	Amphipoda	Control	11	1	
		Impact	5	17	
		$\Delta$	-6	16	22
	Insecta	Control	29	1	
		Impact	6	1	
		$\Delta$	-23	0	23
	Total # of Organisms	Control	77 *	116	
		Impact	50	117	
		$\Delta$	-22	1	23

\* Insects omitted from total # of organisms

Table 6. Mudflat spatial differences ( $\Delta$ ) Impact minus Control in the Before and After periods; and difference of the differences ( $\Delta\Delta$ ) in After difference minus the Before difference.

Mudflat	Organism		Before	After	$\Delta\Delta$
Oligochaeta	Control		13	114	
	Impact		20	0	
	$\Delta$		7	-114	-121
Polychaeta	Control		100	14	
	Impact		125	0	
	$\Delta$		25	-14	-39
Nemertea	Control		1	6	
	Impact		1	1	
	$\Delta$		0	-5	-5
Gastropoda	Control		7	24	
	Impact		6	0	
	$\Delta$		-1	-24	-23
Amphipoda	Control		14	17	
	Impact		13	2	
	$\Delta$		-1	-15	-14
Insecta	Control		0	0	
	Impact		0	0	
	$\Delta$		0	0	0
Total # of Organisms	Control		136	179	
	Impact		166	3	
	$\Delta$		30	-176	-206

Table 7. Fish and crabs collected in the Before (February and March 1998) and After (November 1998) periods.

BEFORE					AFTER				
Collection Date	Location	Organism	Count	Length (mm) and crab sex	Collection Date	Location	Organism	Count	Length (mm) and crab sex
Control 1									
24-Feb-98	trap 1	<i>Fundulus</i>	2	55, 50	05-Dec-98	trap 1	<i>Fundulus</i>	2	46, 58
		<i>Gillichthys</i>	1	110			<i>Pachygrapsus</i>	1	32 male
		<i>Pachygrapsus</i>	1	36 male	05-Dec-98	trap 2	<i>Fundulus</i>	2	43, 24
							<i>Gillichthys</i>	1	46,
							<i>Pachygrapsus</i>	1	32 female
Impact site									
24-Feb-98	trap 1	<i>Fundulus</i>	1	50	11-Nov-98	trap 1	empty		
		<i>Gillichthys</i>	6	90,50,110, 110,115,125	11-Nov-98	trap 2	empty		
					12-Nov-98	trap 1	empty		
					12-Nov-98	trap 2	empty		
Control 2									
2-Mar-98	trap 1	empty			11-Nov-98	trap 1	empty		
					11-Nov-98	trap 2	empty		
					12-Nov-98	trap 1	empty		
					12-Nov-98	trap 2	empty		
Control 3									
24-Feb-98	trap 1	<i>Fundulus</i>	1	60	10-Nov-98	trap 1	<i>Pachygrapsus</i>	1	43 male
		<i>Pachygrapsus</i>	2	30 female, 22 female			<i>Pachygrapsus</i>	1	35 female
					10-Nov-98	trap 2	<i>Fundulus</i>	3	53, 46, 50
						<i>Gillichthys</i>	2	87, 86	

Figure 1. Naval Air Station Point Mugu.

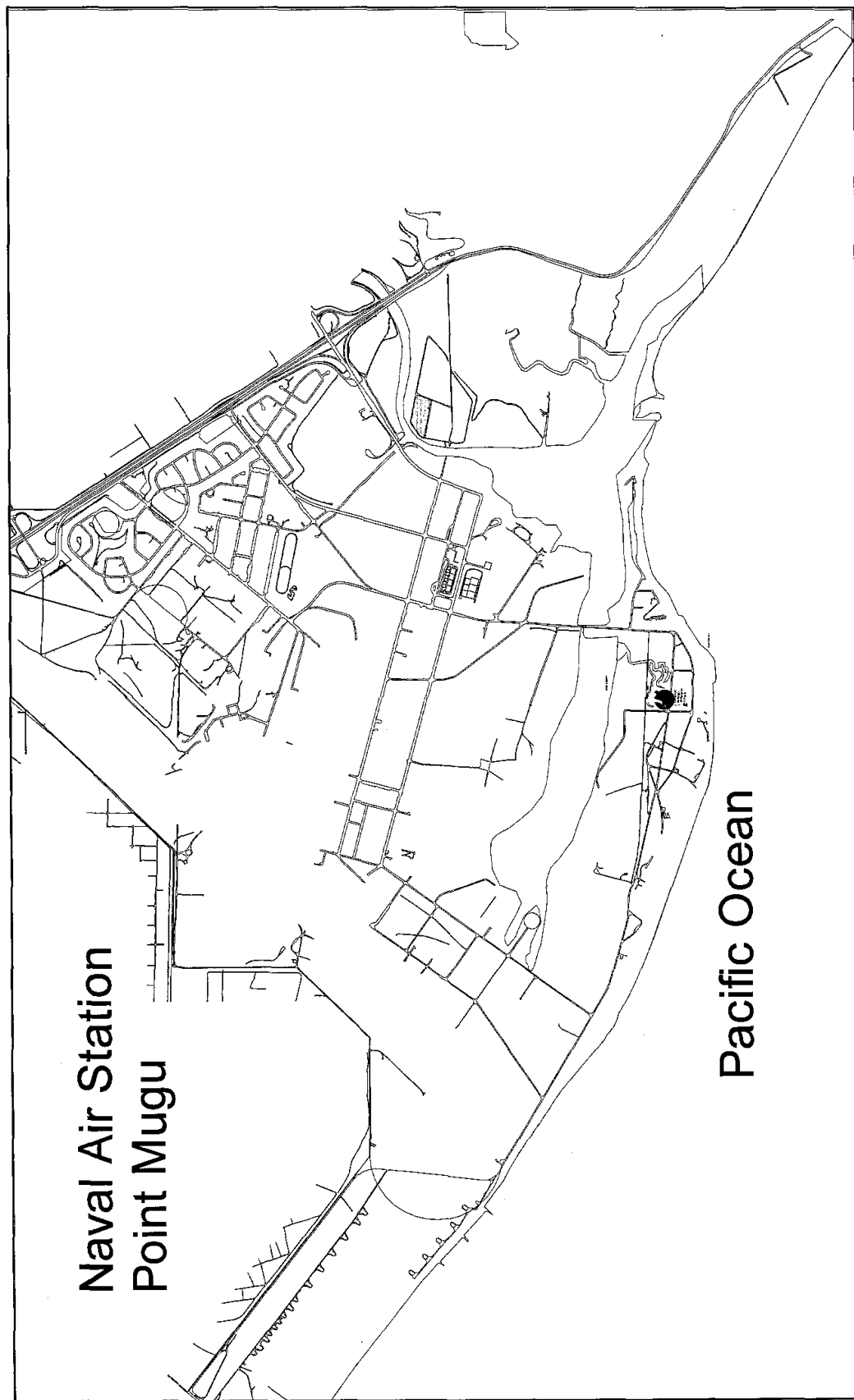


Figure 2. Sampling sites location.

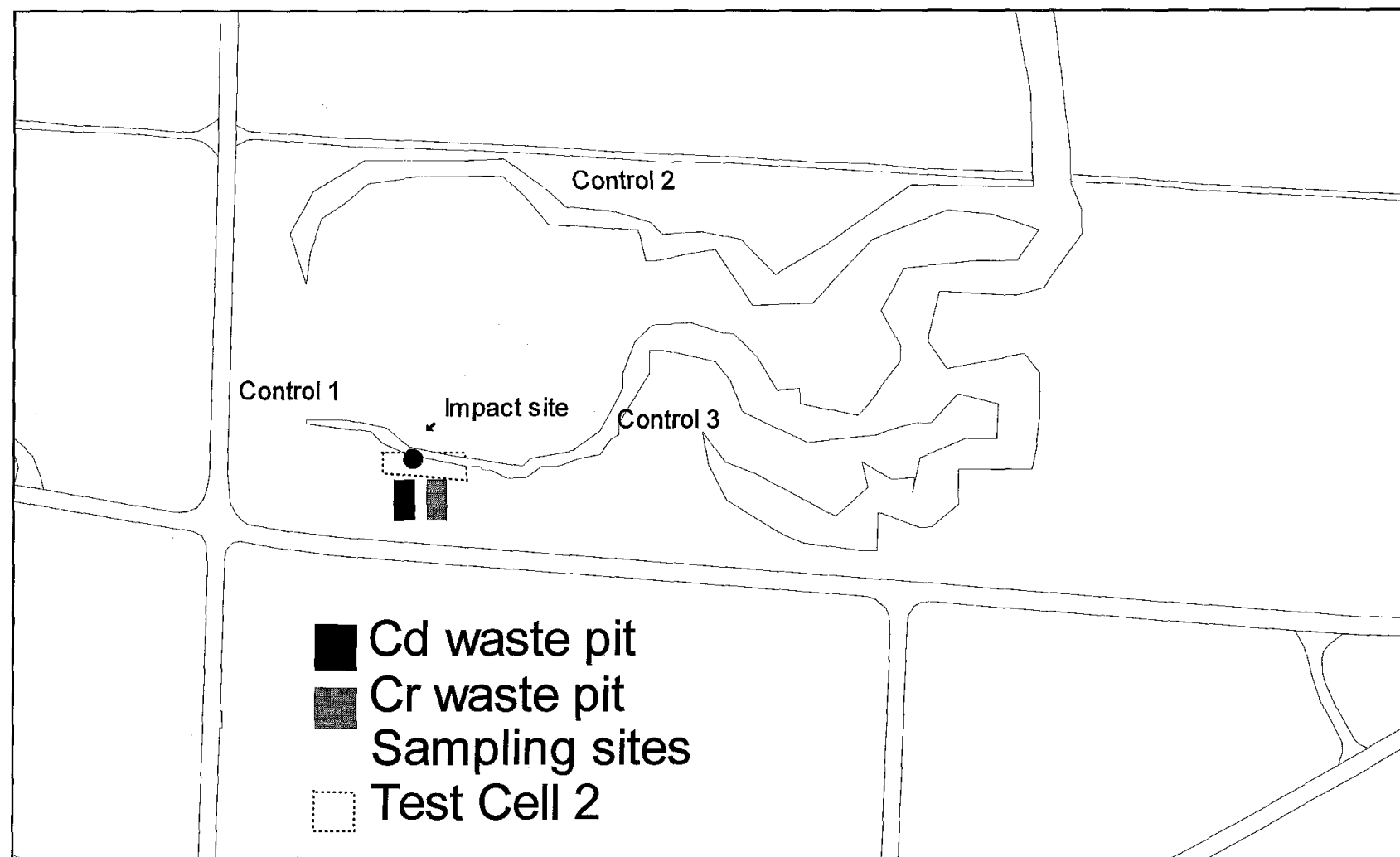


Figure 3. Percent comparison of mudflat infauna abundances in the Before period.

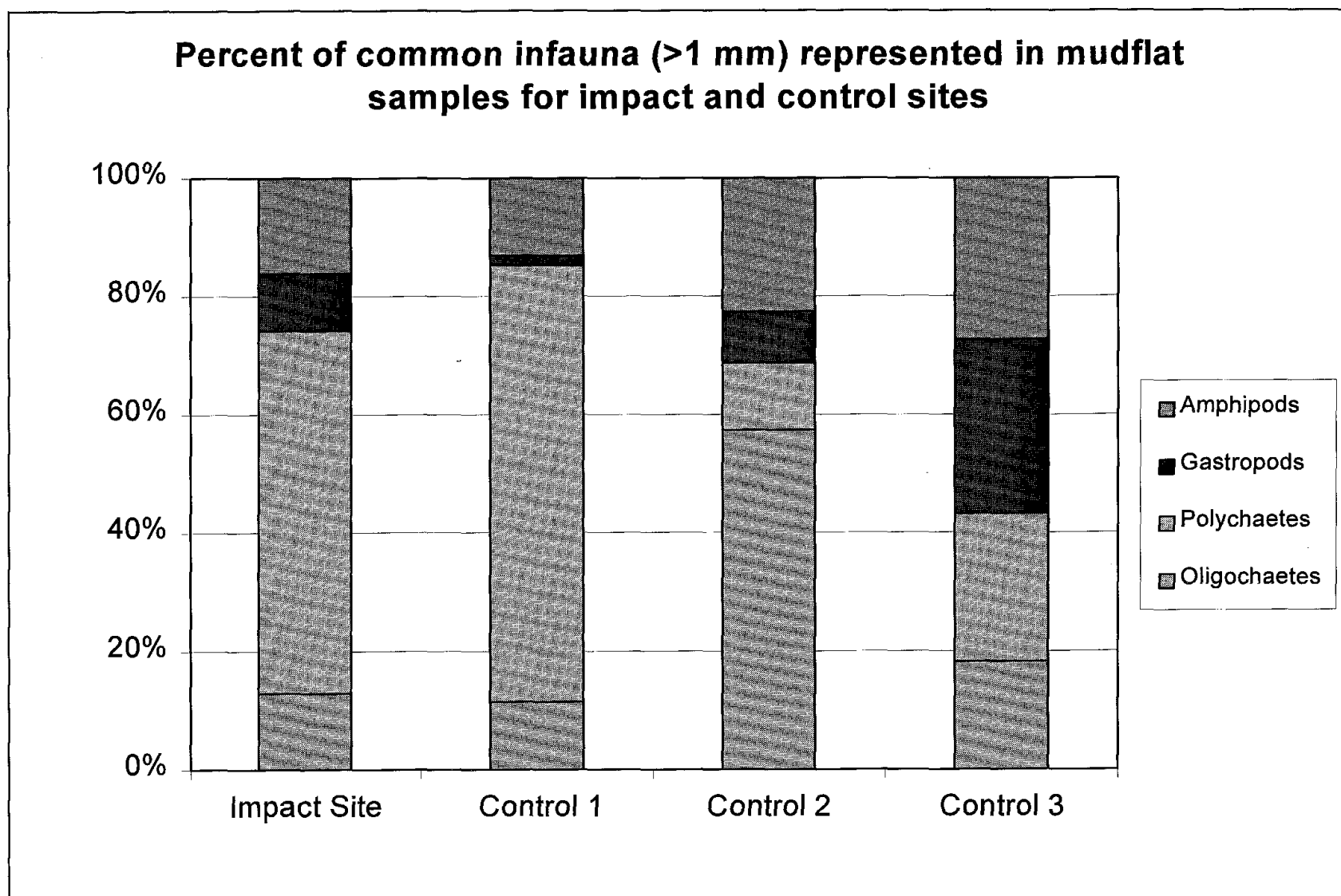




Figure 4. Size distribution of *Cerithidea* at Impact and Control sites from Before sample.

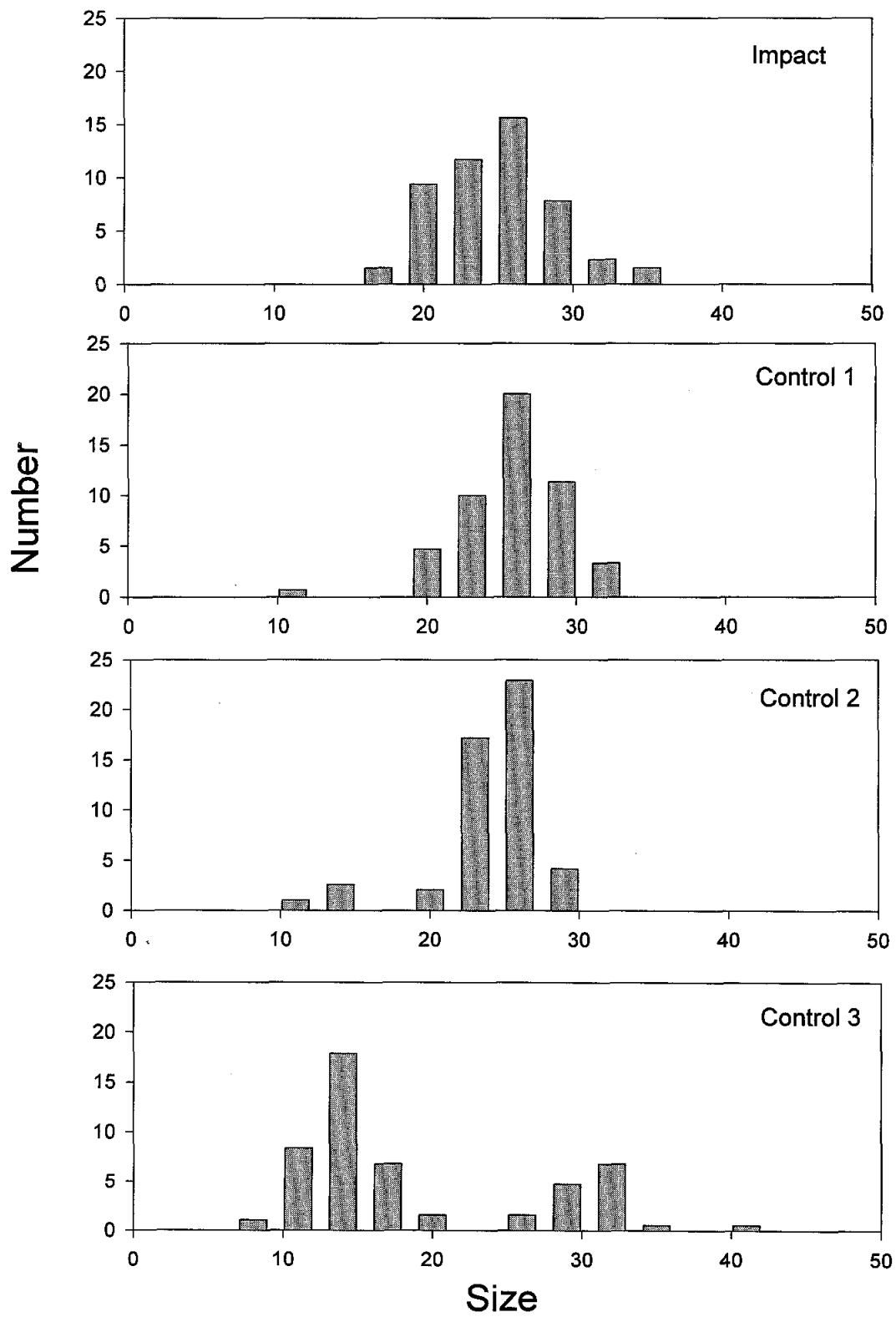


Figure 5. Average salt marsh and mudflat sediment grain size and organic content. Error bars are  $\pm 1$  SD for organic content.

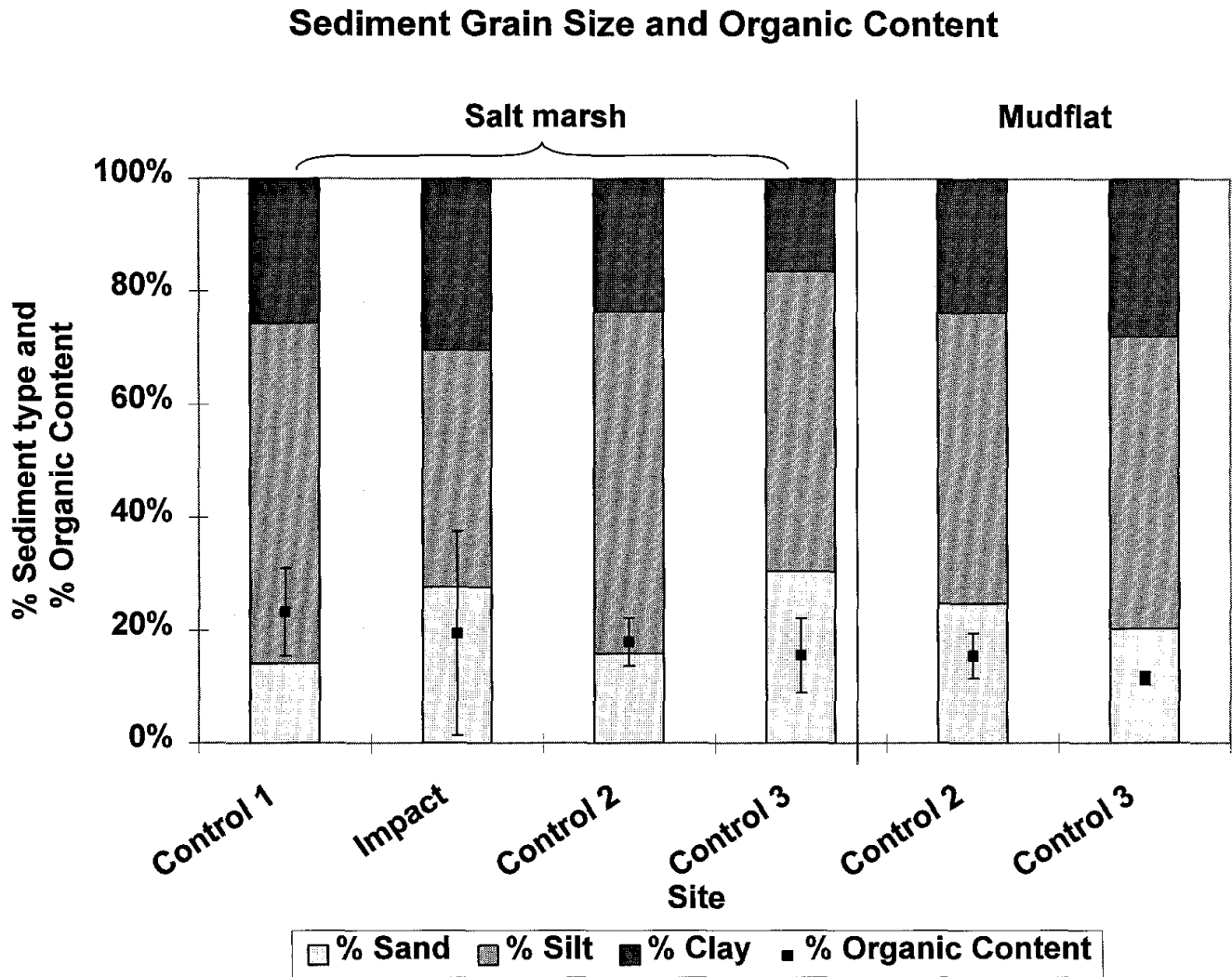


Figure 6. Abundances of major taxa found at Impact and Control 1 sites. Before samples collected in February 1998, After samples collected in November 1998.

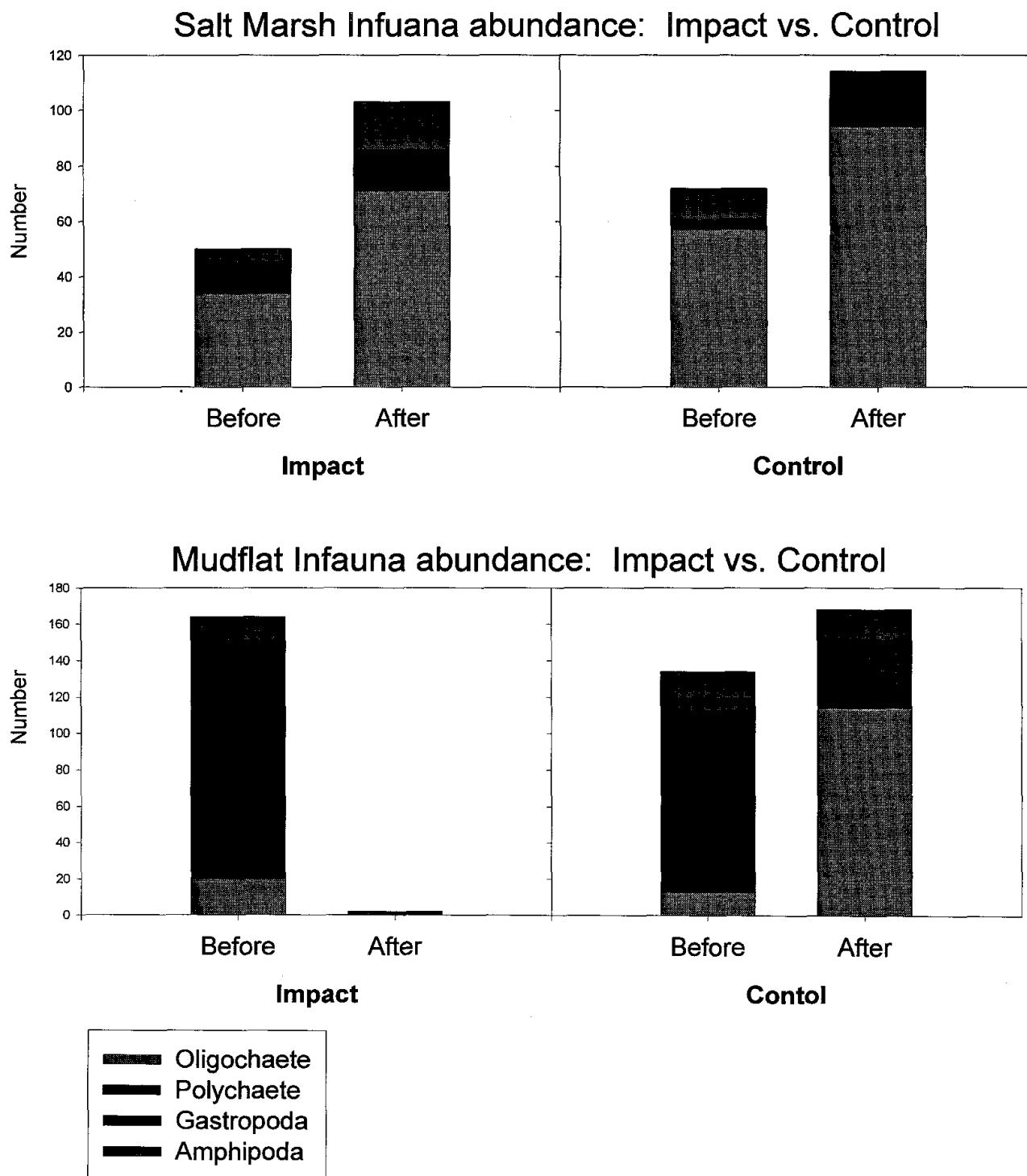
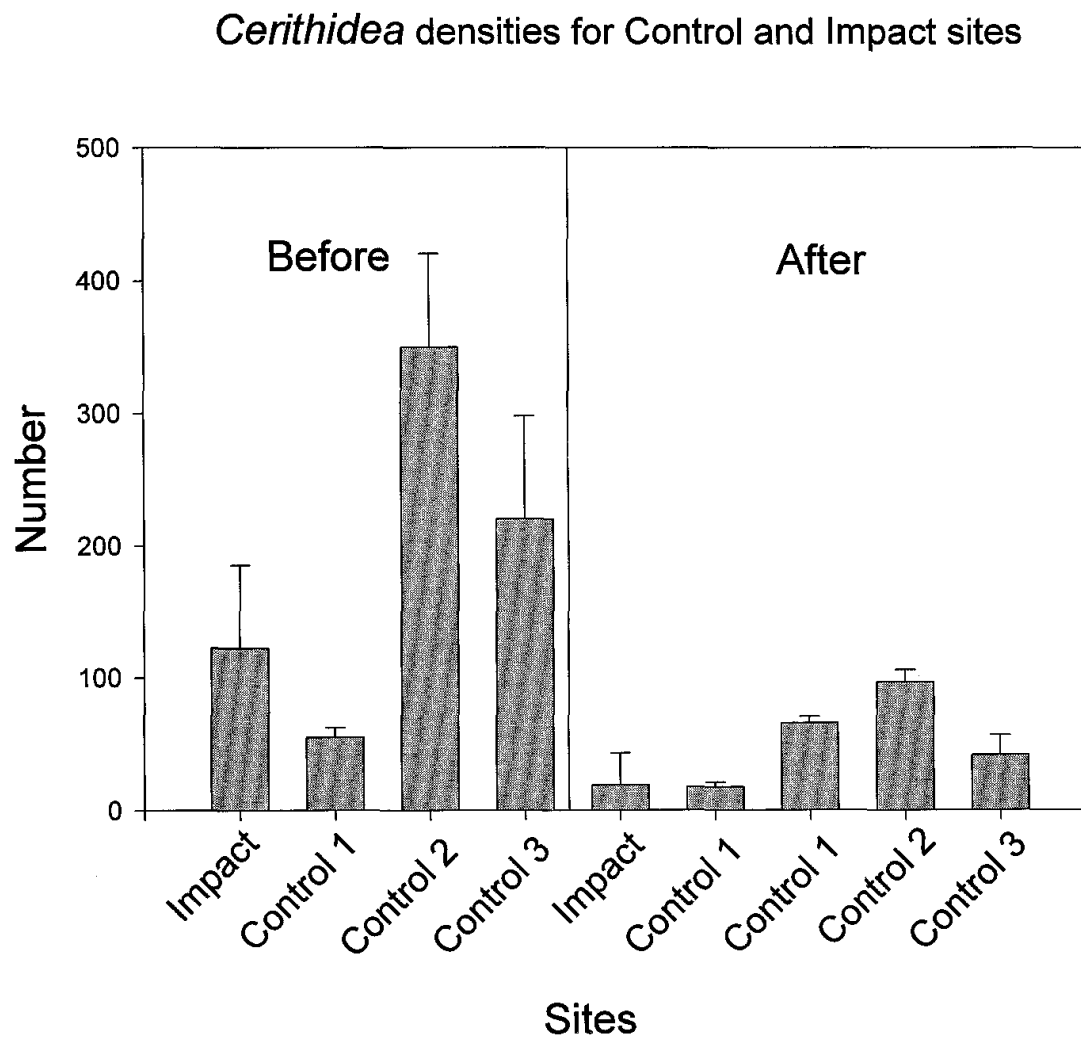


Figure 7. *Cerithidea* densities for all Control and Impact sites. Two Control 1 measurements in the After period because habitat looked altered.



## APPENDIX A

### METALS ANALYSIS

#### **Introduction**

As an optional task, we proposed sampling metals in organisms at the same times that population samples were taken. These analyses would document any changes in tissue burdens that coincide with changes in environmental concentrations (of metals in the sediments). As discussed in this Appendix, we collected the tissues for this analysis, but we were not provided with the funds for the chemical analyses, which would have to be done by a commercial laboratory.

The hexavalent state of chromium is corrosive and causes chronic ulceration and perforation of the nasal septum and other skin surfaces. It also causes cancer of the respiratory tract. However, the trivalent state of chromium is less toxic and is neither irritating nor corrosive. Analysis that differentiates these forms of chromium would allow us to know if the chromium present in the samples is bioavailable.

#### **Methods**

Plant and invertebrate samples were collected for chromium and cadmium tissue concentration analysis in March 1998. The horn snail (*Cerithidea californica*), the green shore crab (*Pachygrapsus oregonensis*), and shoots and roots of pickle weed (*Salicornia virginica*) were collected at all sites for analysis. Additional plants found growing in the waste pits were also collected. All shoots and roots could be examined separately to investigate uptake and deposition of metals within the plant species. *Cerithidea* and *Pachygrapsus* were also collected in November 1998 for metals analysis to examine temporal changes in the epifaunal invertebrates. The samples are stored at UCLA until analysis is requested (Table A1 and A2).

Table A1. Animal samples collected for metals analysis

Sample #	Count	Description	Collection date
Impact T.2.16	64	<i>Cerithidea</i>	19-Feb-98
Control 1 T.1.16	75	<i>Cerithidea</i>	19-Feb-98
Control 3 T.4.16	2	<i>Pachygrapsus-green shore crab</i>	24-Feb-98
Control 1 T.1.18	1	<i>Pachygrapsus</i>	24-Feb-98
Impact T.2.20	5	<i>Fundulus</i>	1-Mar-98
Control 4- T.4.18	69	<i>CERITHIDEA- HORN SNAIL</i>	2-Mar-98
Control 2 T.3.18	64	<i>Certified</i>	2-Mar-98
Control 2 T.3.16	2	<i>Pachygrapsus</i>	2-Mar-98
Control 3 T.4.2	56	<i>Cerithidea</i>	1-Nov-98
Impact T.2.2	50	<i>Cerithidea</i>	1-Nov-98
Control 3 T.4	2	<i>Pachygrapsus</i>	10-Nov-98
Control 1 T.1	2	<i>Pachygrapsus</i>	05-Dec-98
Control 1 T.1.2	50	<i>Cerithidea</i>	1-Mar-99

Table A2. Plant samples collected for metals analysis.

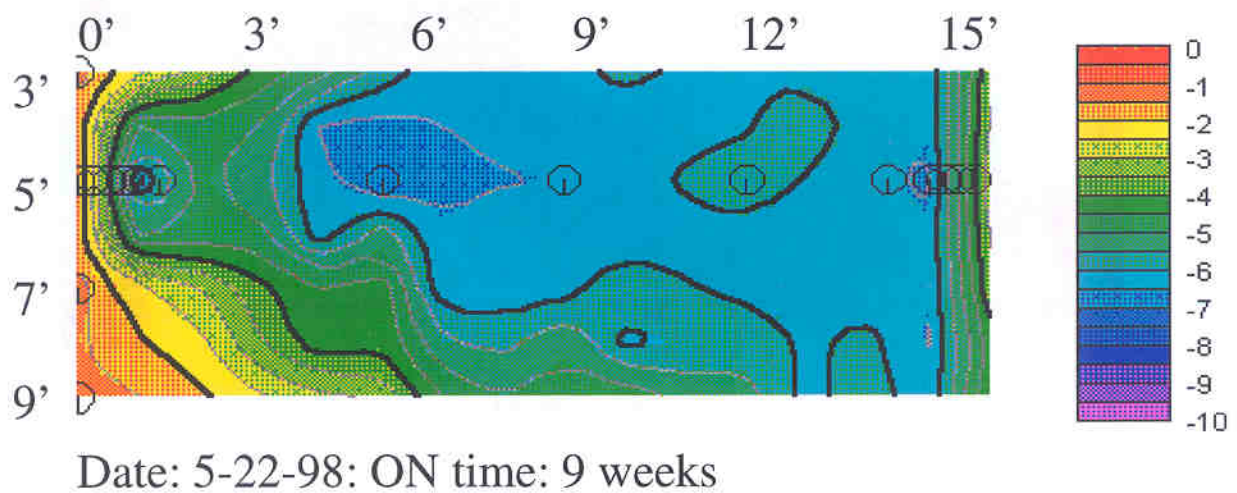
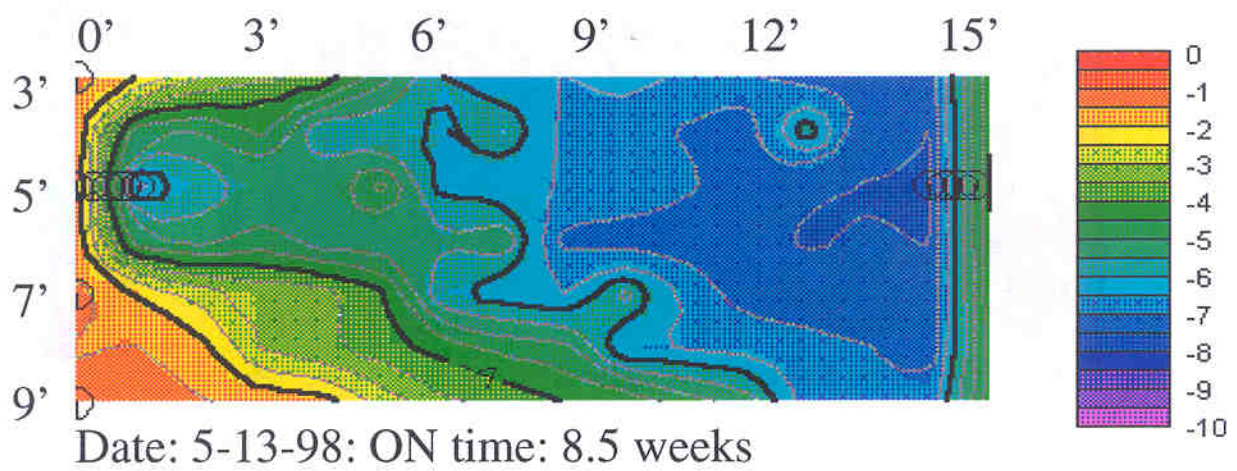
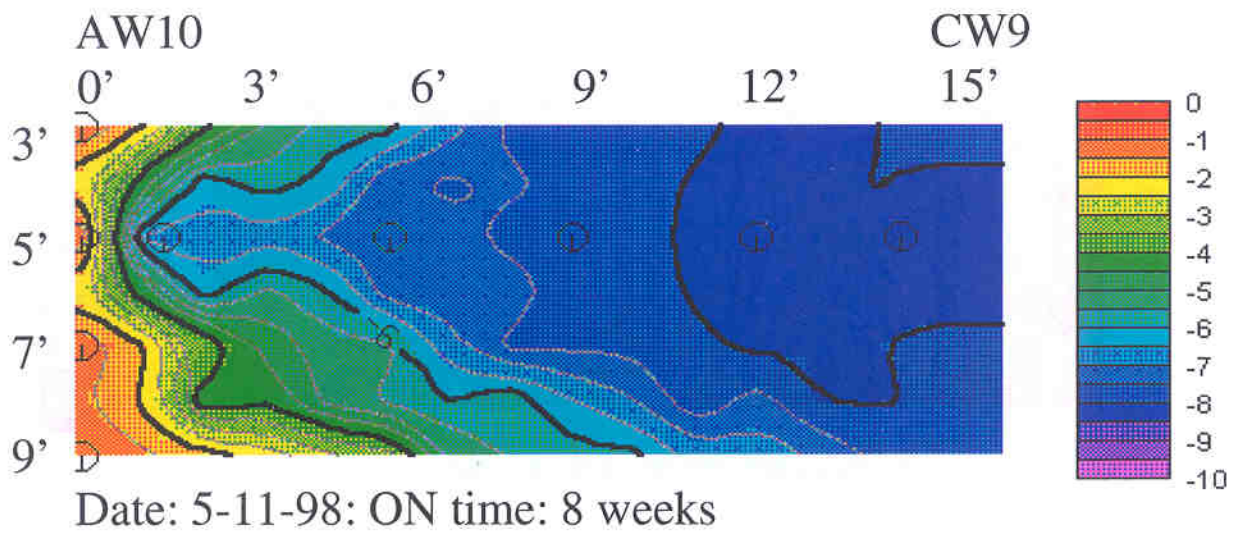
Sample #	Location	Description	Collection date
Control 1-T.1.17	west of pits	<i>Salicornia</i> shoot	19-Feb-98
Control 1-T.1.17	west of pits	<i>Salicornia</i> root	19-Feb-98
Impact-T.2.17	test cell 2	<i>Salicornia</i> shoot	19-Feb-98
Impact-T.2.17	test cell 2	<i>Salicornia</i> root	19-Feb-98
Impact-T.2.18	Cr pit	ice plant shoot	19-Feb-98
Impact-T.2.18	Cr pit	ice plant root	19-Feb-98
Impact-T.2.19	Cr pit	<i>Distichlis</i> shoot	19-Feb-98
Impact-T.2.19	Cr pit	<i>Distichlis</i> root	19-Feb-98
Impact-T.2.20	Cd pit	<i>Distichlis</i> shoot	19-Feb-98
Impact-T.2.20	Cd pit	<i>Distichlis</i> root	19-Feb-98
Control 2-T.3.17	at 8 m mark	<i>Salicornia</i> shoot	2-Mar-98
Control 2-T.3.17	at 8 m mark	<i>Salicornia</i> root	2-Mar-98
Control 3-T.4.17		<i>Salicornia</i> shoot	2-Mar-98
Control 3-T.4.17		<i>Salicornia</i> root	2-Mar-98
T.5.1	east of pits	ice plant shoot	19-Feb-98
T.5.1	east of pits	ice plant root	19-Feb-98
Impact-T.2.21	Cd pit	<i>Typha</i> shoot	19-Feb-98

**APPENDIX G**  
**PROCESS CONTROL ZONE**  
**pH PROFILES**

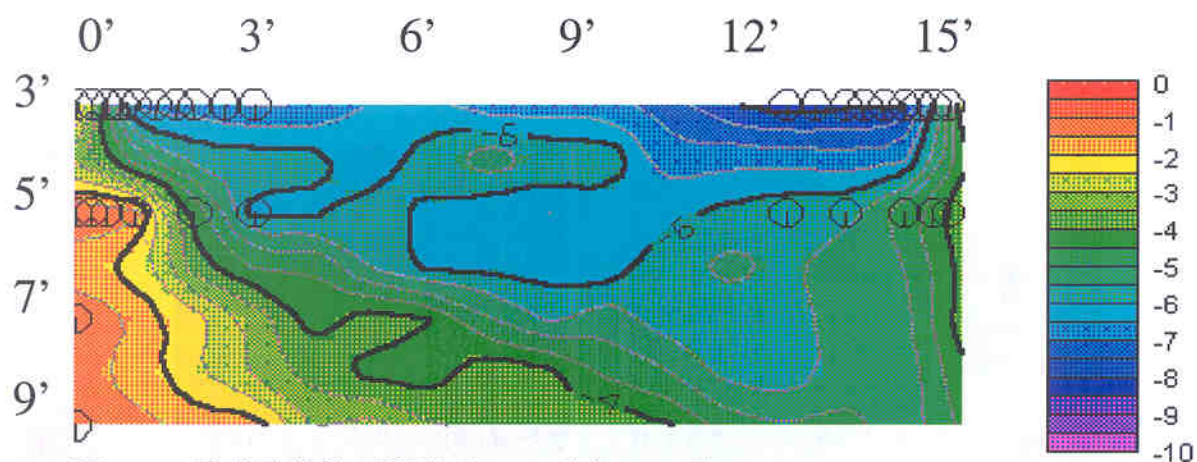


## **Process Control Zone pH Profiles**

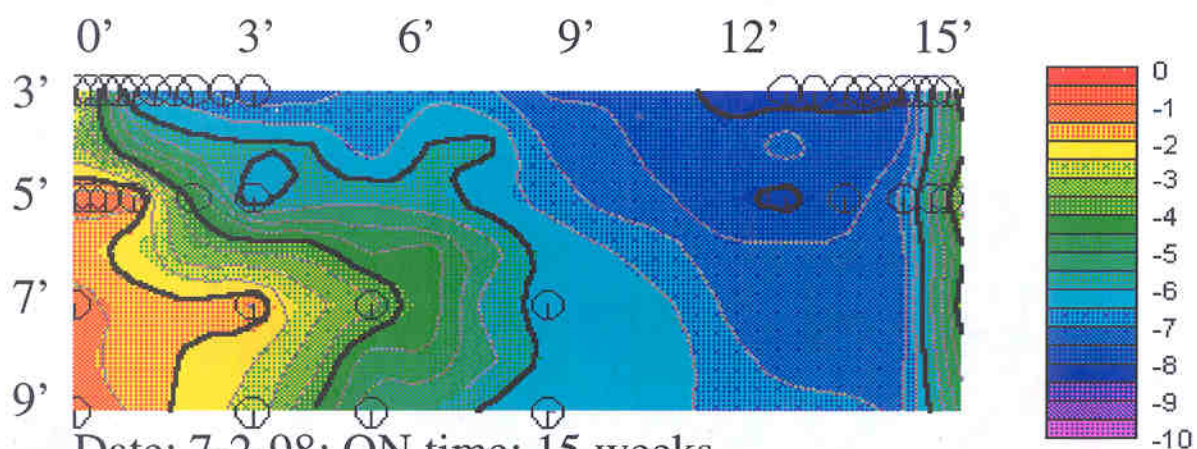
The following series graphs plot the pH profiles measured in the process control zone between anode well 10 and cathode well 9. The data used to develop these graphs were obtained by frequent sampling of ½" piezometer wells located between the electrode wells. Lynntech installed this series of ½" diameter piezometer wells in the process control zone in May 1998 to monitor pH front development. The pH data was gathered between May and October 1998. The series of graphs represents the baseline pH profile and the subsequent profiles taken throughout the 22 weeks of Lynntech's operation of the system. The pH data is presented in a RockWorks Inc. graphics program that interpolates between data points to allow the viewer to gain a visual representation of the profile. The program used an inverse distance gridding method to illustrate the data. With this method, the value assigned to a specific location on the map is a weighted average of a number of directionally distributed neighboring data points. By June 1998, the pH effects in the pore fluid were primarily concentrated within one foot of the anode well. With continued operation of the electrokinetic system at a higher current density, the progress of the pH front development during the remaining period can be seen in the sequence of graphs. A pH front appeared to be migrating from the anode well to the cathode well primarily at the 7-foot depth. The formation of this pH front was considered to be a precursor to metals migration through the treatment area (Hodko et al, 1999).



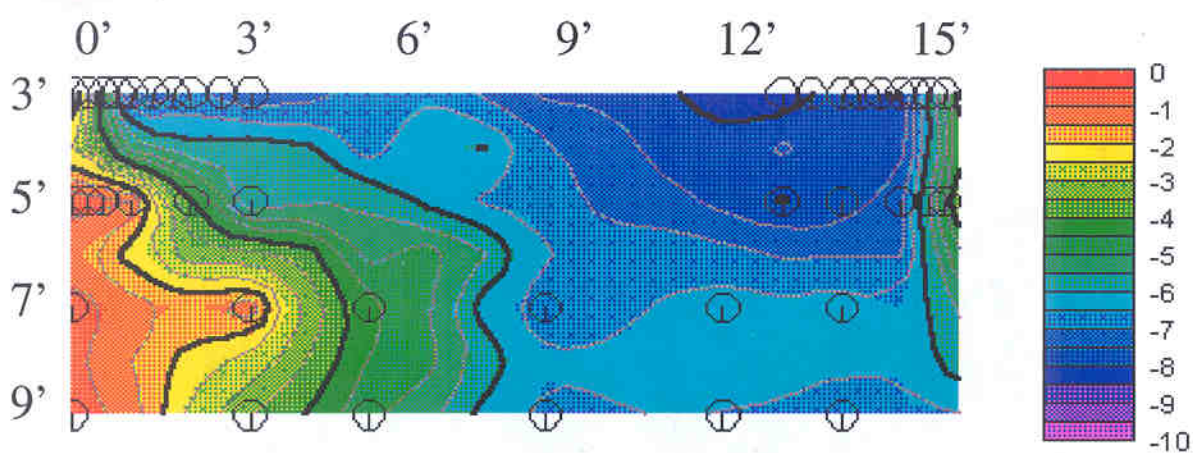




Date: 6-25-98: ON time: 14 weeks



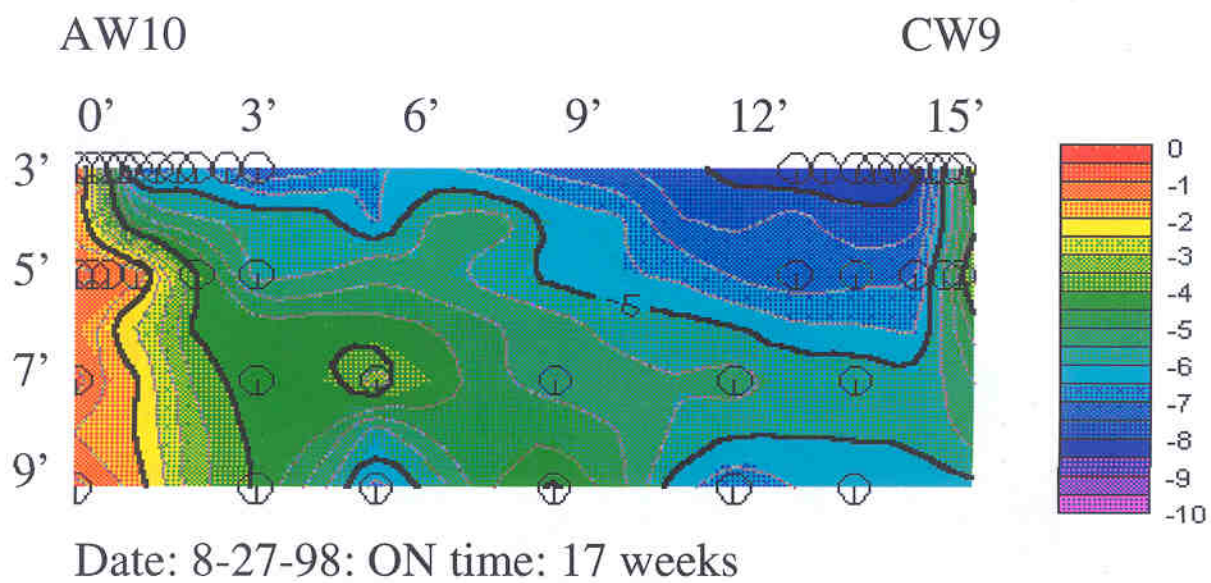
Date: 7-2-98: ON time: 15 weeks



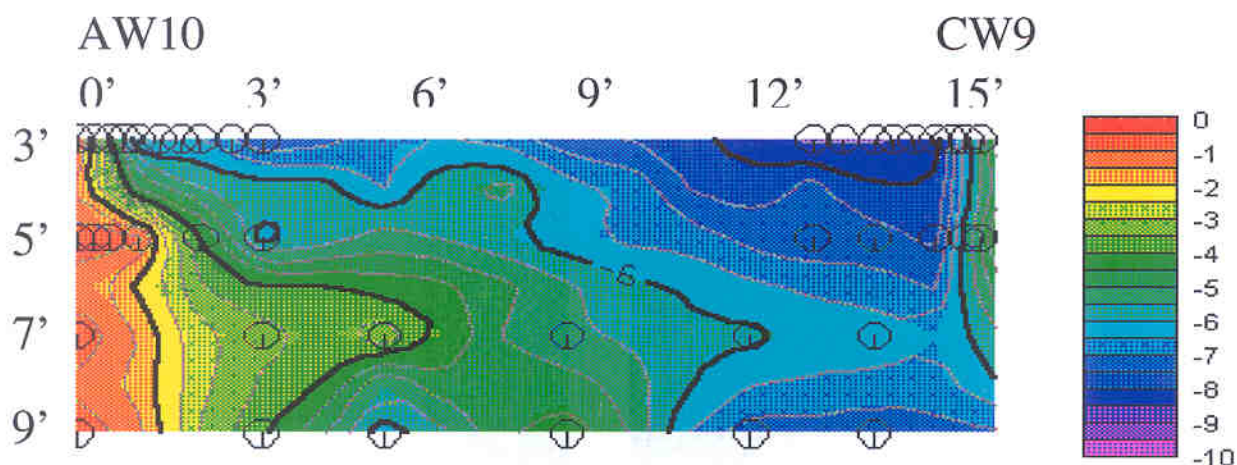
Date: 7-9-98: ON time: 16 weeks

7-13-98: TURN OFF entire site.

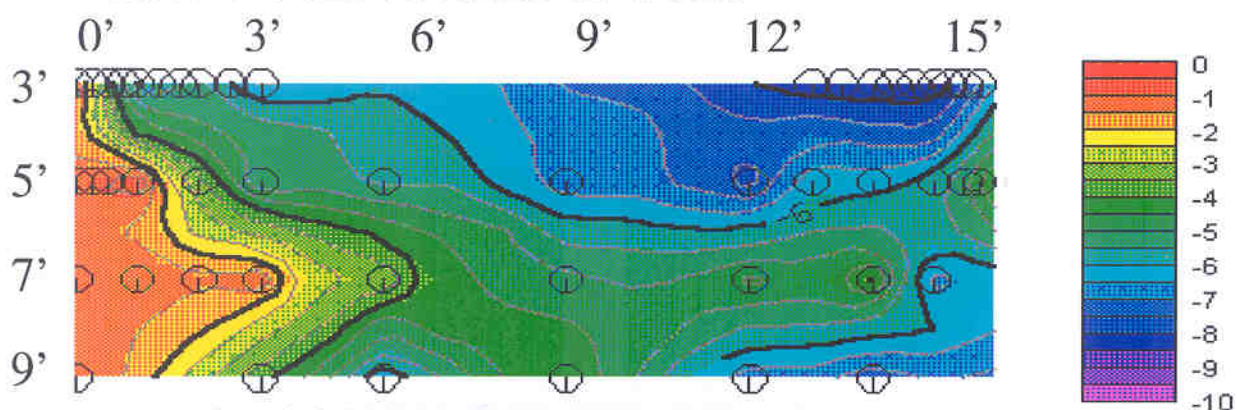
8-21-98: TURN ON entire site.



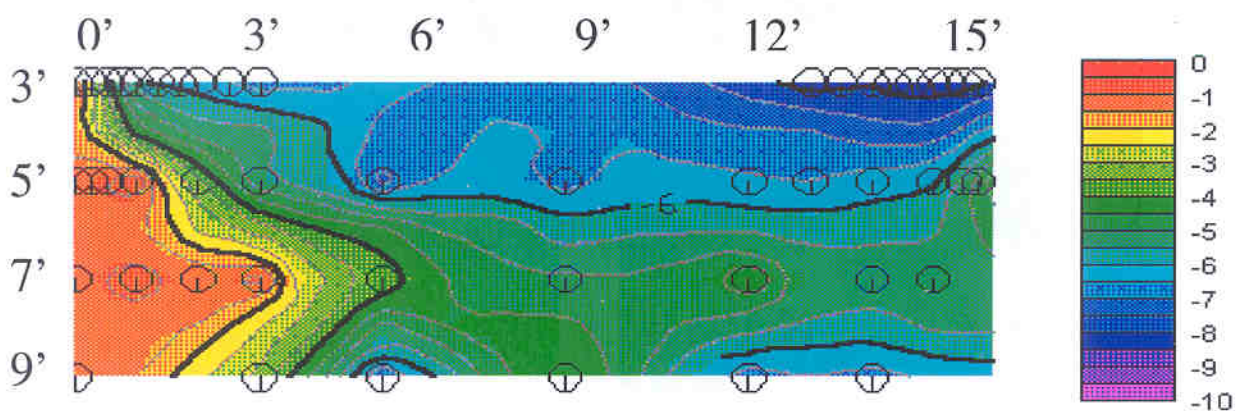




Date: 9-5-98L: ON time: 18 weeks



Date: 9-15-98: ON time: 20 weeks



Date: 9-30-98: ON time: 22 weeks